

# NATURAL HAZARDS AND SAFETY ELEMENT



*“Safeguards are often irksome, but sometimes convenient, and if one needs them at all, one is apt to need them badly.”*

—Henry Adams

Introduction .....	111
Definitions.....	111
Changes Since 1988 .....	113
Summary of Potential Hazards.....	116
Geologic Hazards .....	116
Fire Hazards .....	122
Acceptable Risk.....	127
Goal NH1, Policies, and Strategies .....	131



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## NATURAL HAZARDS AND SAFETY ELEMENT

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EMERGENCY PREPAREDNESS.....	138
Introduction .....	138
Citizens' Emergency Response and Preparedness Program (CERPP) .....	140
Flood Years .....	140
Goal NH2, Policies, and Strategies .....	142

## INTRODUCTION

The Natural Hazards and Safety Element addresses the natural hazard and safety concerns present in Woodside.

The purpose of the Element is to provide a policy basis for measures the Town can take to prevent loss of life, reduce injuries and property damage, and minimize economic and social dislocations which could result from earthquake, fire, or other natural and man-made disasters.

This Element includes: 1) an identification and evaluation of seismic and other geologic, storm, and fire hazards in the Woodside Planning Area; 2) Town policy for reduction of risk and mitigation or abatement of those hazards through land use planning; and, 3) Town policy for emergency preparedness and disaster response.

## DEFINITIONS

**Acceptable Risk:** The level of risk that the majority of citizens will accept without asking for governmental action to provide protection.

**Debris Flow:** Rapidly moving mass of water-saturated debris (suspended earth materials).

**Design Earthquake Ground Motion:** The earthquake ground motion that buildings and structures are specifically designed to resist in the adopted California Building Code Section 1613.

**Erosion:** The gradual wearing away of rock or soil by the action of water, wind, or ice.

**Expansive Soils/Bedrock:** Soils or bedrock that contains minerals that expand when they absorb water and shrink when they dry out. This change in volume can exert enough force to damage buildings and other structures.

**Fault:** A fracture along which the blocks of earth's crust on either side have moved relative to one another parallel to the fracture.

**Fault, Active:** A fault that has had surface displacement within Holocene time (about the last 11,000 years).

**Fault, Inactive:** A fault that has not had surface displacement within Holocene time (about the last 11,000 years).

**Fault, Potentially Active:** A fault that does not have sufficient evidence to determine if it is active or inactive, but is assumed to be active unless determined otherwise.

**Fault Trace:** The line formed by the intersection between a fault plane and the ground surface; it is graphically portrayed as a line plotted on geological maps.

**Fault Zone:** An area of faulting or an area of related faults that may have some width. For example, the active zone of faulting during the Holocene for the Peninsular San Andreas fault ranges up to 10 feet wide, while the San Andreas Rift Zone in Woodside, which includes the active fault zone and inactive faults, is up to about 1000 feet wide.

**Flood or Flooding:** The general and temporary inundation of normally dry land areas from the overflow of streams.

**Floodway:** The Channel of a river or other watercourse through which flood waters flow.

**Ground Failure:** Destabilization of the ground, including by mudslide, landslide, rockslide, soil liquefaction, earth subsidence, lurch cracking, surface faulting, differential settlement, and lateral spreading.

**Hazard:** A source of danger, peril, or jeopardy.

**Landslide:** The downslope movement of masses of earth material.

**Landslide Deposit:** Earthen materials which have been deposited through the process of landsliding.

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**Landslide, by Age:** The age/activity of landslides is generally based on the relative “freshness” of the geomorphology (landform) of the landslide (scarp, margins, internal features, etc) and movement. If the landside is moving or is known to have moved in historic times (last approximately 50 years is reasonable) it is considered to be active. Landslides that have not moved within the last approximately 50 years, but retain relatively “fresh” geomorphic features and likely last moved under climatic conditions similar to the present, are considered to be dormant because they are more likely to be reactivated. The relative age of dormant landslides is greater than approximately 50 years to several thousand years. Old landslides have very eroded and sometimes indistinct geomorphology and are considered to have been active under different climatic conditions in the past, and are generally considered to be stable under present climatic conditions. The relative age of old landslides is several thousand to several tens of thousands of years.

**Risk:** Exposure to hazard with possibility of loss or injury.

**Risk -High:** High probability of damage being inflicted; strong likelihood of property loss or personal injury.

**Risk Rating:** For purposes of this General Plan, risk parameters set forth in Tables NH3 and NH4.

**Sedimentation:** The process by which soil particles are suspended in water and redeposited further downstream.

#### SEISMIC HAZARDS:

**Faulting:** A fracture in bedrock caused by displacement resulting from the action of tectonic forces.

**Ground Settlement:** The sinking of an area of land caused by the withdrawal of water from the ground or the gradual settlement of unconsolidated alluvial deposits or artificial fill.

**Ground Shaking:** Surface ground movement caused by an earthquake. The intensity of ground shaking is affected by the tectonic structure framework and near-surface geology in the location of the earthquake. Ground shaking can be measured by a seismometer. Measurements include seismic acceleration, which can be further broken down into vertical measurements (up-down shaking) and two horizontal measurements (east-west and north-south shaking).

**Liquefaction:** The phenomenon in which water saturated soil temporarily loses strength when subjected to seismic shaking, and then flows as a fluid, in a manner similar to quicksand.

**Seiches:** An earthquake-induced wave from oscillation in an enclosed body of water.

**Seismic Induced Landslides:** Slope failure caused by an earthquake.

## CHANGES SINCE 1988

### Events

The following natural and man-made disasters occurred since the last General Plan update:

#### LOMA PRIETA EARTHQUAKE 1989

The Loma Prieta earthquake was a major earthquake caused by movement along the San Andreas Fault that struck the San Francisco Bay Area on October 17, 1989. It lasted ten to fifteen seconds and measured 6.9 on the Richter Scale. It killed 63 people and injured 3,757. The epicenter of this earthquake was approximately 45 miles southeast of Woodside.

#### THE OAKLAND HILLS FIRESTORM

On October 19, 1991, a grass fire began on a steep hillside which was initially thought controlled, but re-ignited the next day. Nearly 3,000 homes were destroyed and 25 people were killed in the blaze, which took days to contain.

#### NORTHRIDGE EARTHQUAKE 1994

The Northridge earthquake struck in the northern portion of Los Angeles County on January 17, 1994. This was a magnitude 6.7 earthquake that lasted 45 seconds, killed 72 people, and injured over 9,000.

#### ALBION FIRE 2002

The Albion fire occurred on August 9, 2002 in Woodside when a falling branch severed a PG&E line, igniting grass and eucalyptus debris. The fire burned over half an acre and the roof of one home. The fire was extinguished and damage was limited due to the excellent response time of the fire department, low wind, and level terrain.

#### SAN BRUNO FIRE 2010

On September 9, 2010, a 30 inch Pacific Gas & Electric high pressure natural gas transmission pipeline exploded in San Bruno. A major fire erupted, destroying 38 homes, killing eight people, and sending many others to the hospital.

### Responses

The following changes occurred in response to the natural disasters discussed above.

#### FIRE HAZARD ZONE DESIGNATION AND FIRE REGULATIONS

In 2008, the Woodside Town Council adopted Ordinance 2008-542, designating the western foothills and Emerald Hills as “Very High Fire Hazard Severity Zones” (VHFHSZ). In 2009, the Woodside Town Council adopted Ordinance 2009-544, designating new regulations incorporating fire resistive materials and construction methods. In summary, these fire prevention regulations required a higher level of fire resistance materials and construction methods throughout Town, and additional site improvement and defensible space are required.

#### FIRE MANAGEMENT PLAN

In 2003, following the Albion Fire, the Town commissioned a Fire Management Plan, prepared by a consulting firm comprised of three former fire chiefs. The Plan included fourteen recommendations aimed at strengthening the Town’s ability to reduce fire risk, to become as prepared as possible to respond to a fire, and to integrate considerations of fire risk reduction into the Town’s regulatory and educational systems and processes. More information about the Fire Management Plan is included later in this Element.

#### ENHANCED EARTHQUAKE STANDARDS AFTER THE LOMA PRIETA AND NOTHRIDGE EARTHQUAKES

With each major earthquake comes new understanding of the way in which buildings respond to them. Advances in the technology associated with testing systems, design and seismic modeling software, structural connections, structural forms, and seismic force resisting systems accelerated dramatically since the 1989 Loma Prieta Earthquake and 1994 Northridge Earthquake.

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The Uniform Building Code (UBC) was first published in 1927 by the International Council of Building Officials. It was intended to promote public safety and provided standardized requirements for safe construction which would not vary from city to city as had previously been the case. Updated editions of the UBC code were published by the International Council of Building Officials until 1997, when the final published version of the Uniform Building Code was released. The State of California continued to use the 1997 UBC model code until the adoption of the 2007 California Building Code, which adopted the new International Building Code (IBC) published by the International Code Council (ICC). The ICC was a merger of three predecessor organizations which published three different building codes across the United States. The new IBC was intended to provide consistent standards for safe construction and eliminate differences between the three different predecessor codes that were in use across the United States.

## **EARTHQUAKE FAULT ZONES AND SEISMIC HAZARD ZONES**

The State of California legislature passed the Alquist-Priolo Earthquake Fault Zoning Act in 1972 (Public Resources Code, Chapter 7.5, Division 2, Sections 2623). The Act requires the State Geologist (California Geological Survey) to create maps delineating zones around the surface traces of active and potential active faults (faults that have, or may have been, active during the Holocene epoch (approximately past 11,000 years). The Town of Woodside is covered by the Palo Alto and Woodside Quadrangles, and the Alquist-Priolo fault zones are shown on Map NH2, Fault Zones Map.

Local agencies, such as the Town of Woodside, are required to implement the Alquist-Priolo Earthquake Fault Zoning Act by regulating development within the zones to prohibit structures for human occupancy from being located on an active fault or within a setback from the fault, generally 50 feet, by requiring and reviewing site-specific investigations for projects within earthquake hazard zones. Such investigations may be a desk study or a fault trench investigation. Since 1988, a number of fault

trench investigations have been conducted by the US Geologic Survey for research, and by private applicants for proposed development, in Woodside and adjacent areas. These investigations have better defined the location and characteristics of much of the active trace of the San Andreas Fault zone in Woodside, and have also determined that some mapped potentially active fault traces do not exist.

Well located and known faults requiring 50-foot setbacks (active fault zones), and poorly located and potentially active faults requiring 100 foot setbacks (potentially active fault zones), are being compiled by the Town in geographic information system map form. This map is updated as new information is available. No structure for human occupancy is permitted within active fault zones.

Additionally, the State of California legislature passed the Seismic Hazards Mapping Act in 1990. The Act requires the State Geologist to create maps delineating zones where data suggest seismically-induced landsliding or seismically-induced liquefaction may occur. These maps are generally compiled from existing data, often provided by local agencies, such as the Town of Woodside.

Local agencies are required to implement the Seismic Hazards Mapping Act by requiring and reviewing site-specific investigations for projects within seismic hazard zones to determine if the hazard exists, and to approve only those projects within seismic hazard zones that are engineered and constructed to mitigate the hazard.

## **2007 CBC EXPANSIVE SOIL REQUIREMENTS**

Large areas of the Town of Woodside are underlain by the expansive soils of the Whiskey Hill Formation (formerly Butano Formation) and the Santa Clara Formation, both of which are known to have potentially expansive units (predominantly claystone). Soils and surficial deposits, including colluvium, alluvium, and landslide deposits, derived from these formations can also be potentially expansive. In addition, serpentinite, which underlies portions of the eastern hills, can weather to soils that are potentially expansive.

Expansive soils and bedrock, if not properly identified, characterized, and appropriately mitigated, can cause significant damage to foundations, other structural elements, and to site pavement. The California Building Code (CBC) requires preparation of a geotechnical investigation report, including laboratory soil test data, in order to determine whether expansive soils and expansive bedrock are present at a particular site. In the event that expansive soils and/or expansive bedrock are present, then the geotechnical consultant is required to provide foundation design recommendations.

The CBC establishes minimum standards for geotechnical design recommendations, which includes criteria for structural design of footings and foundations located on expansive soils and/or expansive bedrock. Laboratory test data and written analysis must be included in the geotechnical investigation report.

## SUMMARY OF POTENTIAL HAZARDS

The Woodside Planning Area is exposed to significant geologic and fire hazards.

### GEOLOGIC HAZARDS

The Geologic Hazards Map, Map NH1, divides the Town into four general zones that have a range of potential geologic hazards. Table NH1, Potential Hazards, lists the potential hazards in each of the zones. Each potential hazard listed in Table NH1 is described in detail following the table. Specific fault (Map NH2), flood (Map NH3), and fire (Map NH4) zone maps are also included in this Element.

**Table NH1: Potential Hazards**

Potential Hazards	HAZARD UNITS			
	A	B1	B2	B3
Erosion / Sedimentation	No <sup>1</sup>	Yes	Yes	Yes
Expansive Soils / Expensive Bedrock	Yes	Yes	Yes	Yes
Fault Ground Rupture	Yes	No	Yes	No
Flooding	Yes <sup>4</sup>	No <sup>3</sup>	No <sup>3</sup>	No <sup>3</sup>
Landsliding / Slope Instability	No <sup>1</sup>	Yes	Yes	Yes
Seismic Ground Shaking <sup>6</sup>	Yes	Yes	Yes	Yes
Seismically-Induced Landslides <sup>5</sup>	No <sup>1</sup>	Yes	Yes	Yes
Seismically-Induced Liquefaction <sup>5</sup>	Yes	No <sup>2</sup>	No <sup>2</sup>	No <sup>2</sup>
Settlement	Yes	No <sup>2</sup>	No <sup>2</sup>	No <sup>2</sup>
Shallow Groundwater	Yes	Yes <sup>3</sup>	No <sup>3</sup>	Yes
Steep Slopes	No <sup>1</sup>	Yes	Yes <sup>3</sup>	Yes

1. Except along stream corridors

2. Except along stream corridors and in areas of fill

3. Locally

4. See Federal Flood Insurance Rate Maps (FIRM) Map NH2

5. See State Hazards Zones Maps

6. See current Californic Building Code (CBC)

Source: Woodside Town Geologist

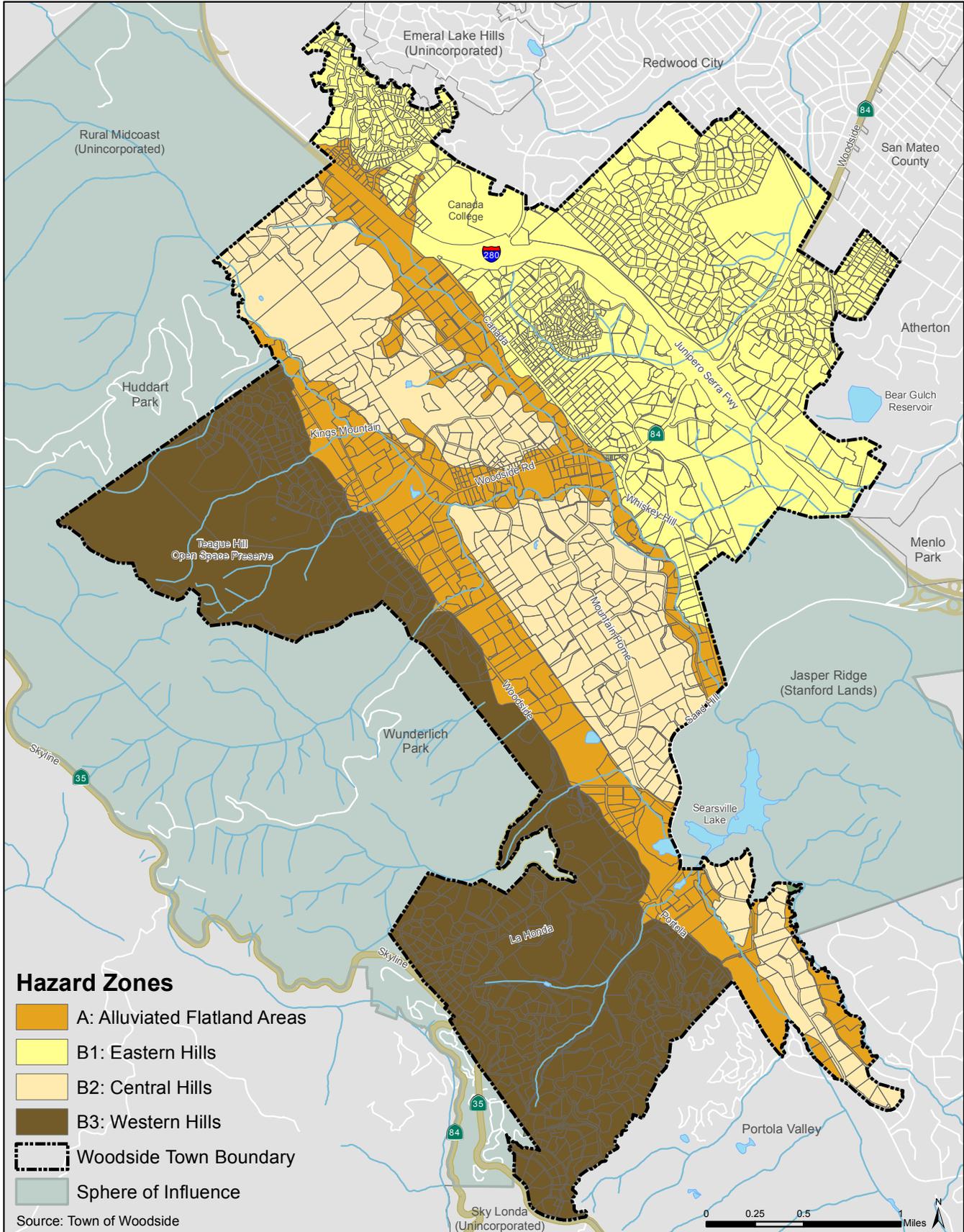
### EROSION AND SEDIMENTATION

Erosion and sedimentation are on-going natural processes and the rate of erosion at any particular location is related to the type of soil material, slope, and character of ground cover. Where natural conditions are disturbed, erosion can be greatly accelerated and cause damage both to the site on which it occurs and in downslope areas where water-borne sediments are deposited. The steep western hills present the highest erosion potential. Town regulations require the retention of vegetation and limits on grading to minimize erosion and sedimentation.

### EXPANSIVE SOILS AND BEDROCK

Some soils and bedrock expand when they get wet and shrink when they dry, which can be damaging to structures. Although it is known that the severity of this condition varies with location, no detailed map of potentially expansive soils and bedrock in the Planning Area is presently available. However, soil and bedrock within the Whiskey Hill Formation and the Santa Clara Formation, as well as Serpentine areas, are known to be potentially expansive. For this reason, site specific soils investigations are required for most parcels in Woodside.

Map NH1: Geologic Hazards



## FAULTING

Some traces of the San Andreas Fault zone in the Woodside area are active and others are potentially active. Maximum horizontal ground displacement on the San Andreas fault zone in the 1906 earthquake was approximately 30 feet in southern Marin County, with approximately 3 feet in the Woodside area. While future fault movement is most likely to occur along identified active traces, there is always the possibility that movement may occur along traces previously deemed to be inactive or not previously identified. Map NH2, Fault Zones, shows significant faults from the USGS and the State Alquist-Priolo Special Studies Zones boundaries. Map NH2 is for general information only.

The most detailed fault information regarding the location and activity of faults in Woodside is site-specific fault investigation trenching reports prepared for development projects in Woodside. The graphic information in these reports is being compiled by the Town in geographic information system (GIS) map form. The map is updated periodically based on new reports.

## GROUND SHAKING

Woodside experienced considerable damage from earthquake shaking in the 1906 earthquake, which is estimated to have been of a Richter magnitude 8.3. Experts estimate that there is “significant probability” that the San Andreas fault zone will experience an earthquake of magnitude 7.0 or greater sometime during the next 30 years; this could be in the Woodside area, or elsewhere along other sections of the fault.

Effects of ground shaking will vary with different rock formations, soil conditions, and the amount of water present. Those areas which have thick, unconsolidated, water-soaked alluvial deposits have a greater potential for damaging effects due to earthquake shaking than do areas of firm bedrock.

Appropriate earthquake design for projects in Woodside should be in accordance with the CBC seismic standards.

## GROUND SETTLEMENT

Ground settlement is the sinking of an area of land, and is caused by the withdrawal of water from the ground, or the gradual settlement of unconsolidated alluvial deposits or artificial fill. Ground settlement may also be brought about by the shaking of earthquakes. It has been a major source of property damage in other areas of the world. Geologic information is not sufficient to determine whether or not the alluvial areas of Woodside would be subject to substantial ground settlement in the event of an earthquake.

## LANDSLIDES

Landslides are the movement of earth downslope; this movement may be rapid (as in a rock-fall or debris flow), or very slow and gradual (as in creep). In a landslide prone area, landslides can be “triggered” in many different ways, such as: by cutting away the toe of slope in grading for site development or road construction; adding more weight to an area by earth fill, building construction, or water from very heavy rain; or by shaking from an earthquake.

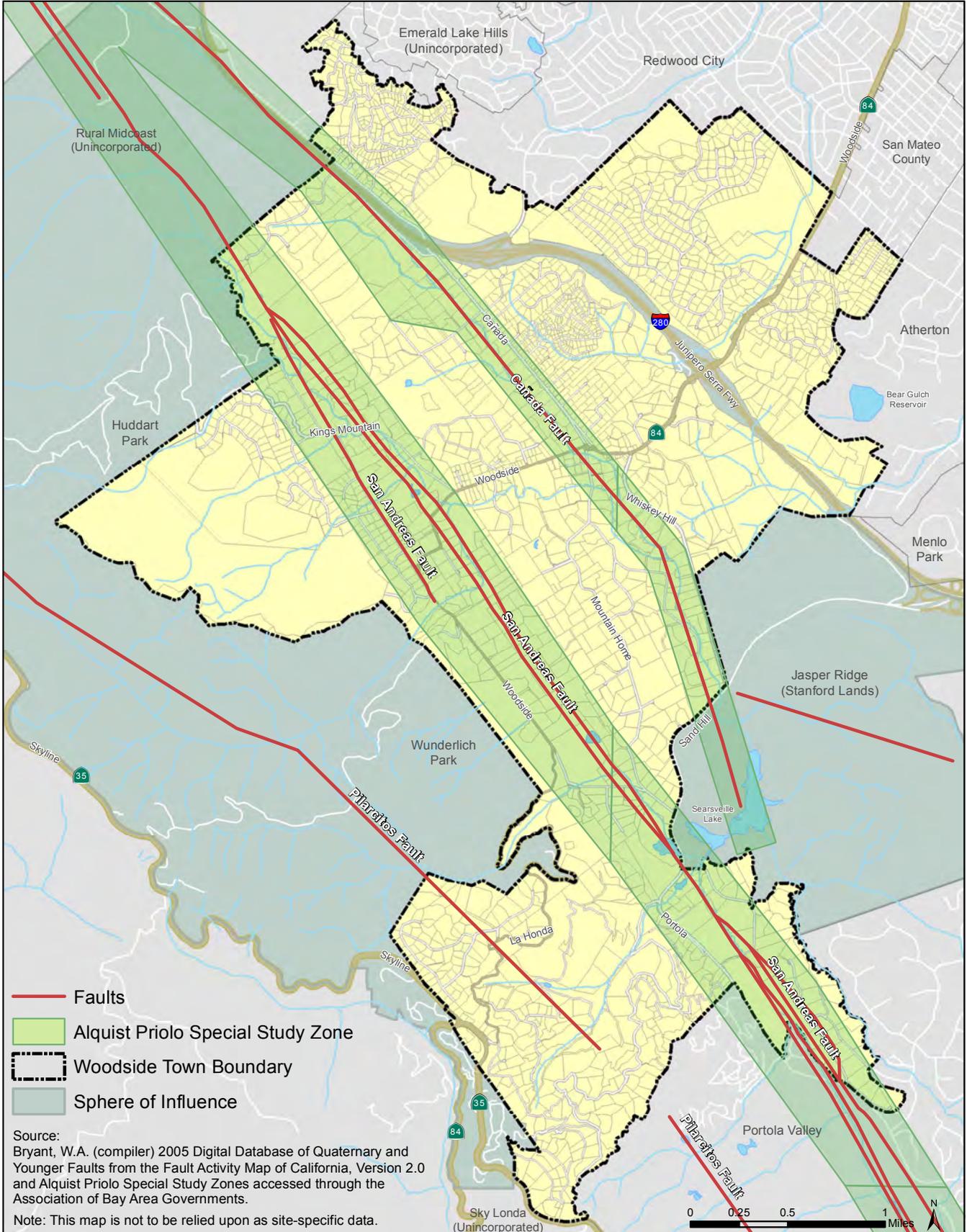
A significant portion, 65% to 75%, of the western hills is subject to landslide activity. There is the greatest potential for seismically-induced landsliding in Hazard Zones B (Map NH1).

**Table NH2: Relative Groundshaking Potential in the Woodside Planning Area.**



Geologic Zone	
A	SURFICAL MATERIALS: Generally young, unconsolidated alluvial and colluvial deposits of gravels, sand, silt, and clay; broken landslide debris and artificial fill; locally saturated, alluvial deposits confined to valley floors.
B	NEAR-BEDROCK MATERIALS: Semi-consolidated to consolidated older alluvial deposits of gravel, and silt, and clay; confined mostly to stream terraces and low foothills.
C	BEDROCK MATERIALS: Hard stratified to massive deposits of sandstone, shale, minor conglomerate, and serpentine and mafic volcanic rocks; exposed in foothills and higher mountain terrain.

### Map NH2: Fault Zones



- Faults
- Alquist Priolo Special Study Zone
- Woodside Town Boundary
- Sphere of Influence

Source: Bryant, W.A. (compiler) 2005 Digital Database of Quaternary and Younger Faults from the Fault Activity Map of California, Version 2.0 and Alquist Priolo Special Study Zones accessed through the Association of Bay Area Governments.  
 Note: This map is not to be relied upon as site-specific data.

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## FLOODING

Historically, flooding has not been severe in Woodside. However, Woodside has experienced minor flooding in areas adjacent to streams for many years. Areas subject to flooding are shown on Map NH3, Flood Zones Map and require special consideration when development is proposed. This map is based on the Federal Flood Insurance Rate Maps (FIRM) prepared by the Department of Housing and Urban Development in 1979. Certain areas adjacent to major creeks in Woodside are designated flood plains. Most of the flood plain areas are in the southern part of Woodside along Alambique, Sausal, and Corte Madera Creeks. Small sections of West Union Creek and Dry Creek in central Woodside also are in the flood plain.

Development resulting in impervious surfaces and paved areas increase runoffs and the potential for flooding. The Town of Woodside enforces the Federal Emergency Management Administration's (FEMA) flood plain administration regulations, which regulates impervious surface coverage, and site drainage.

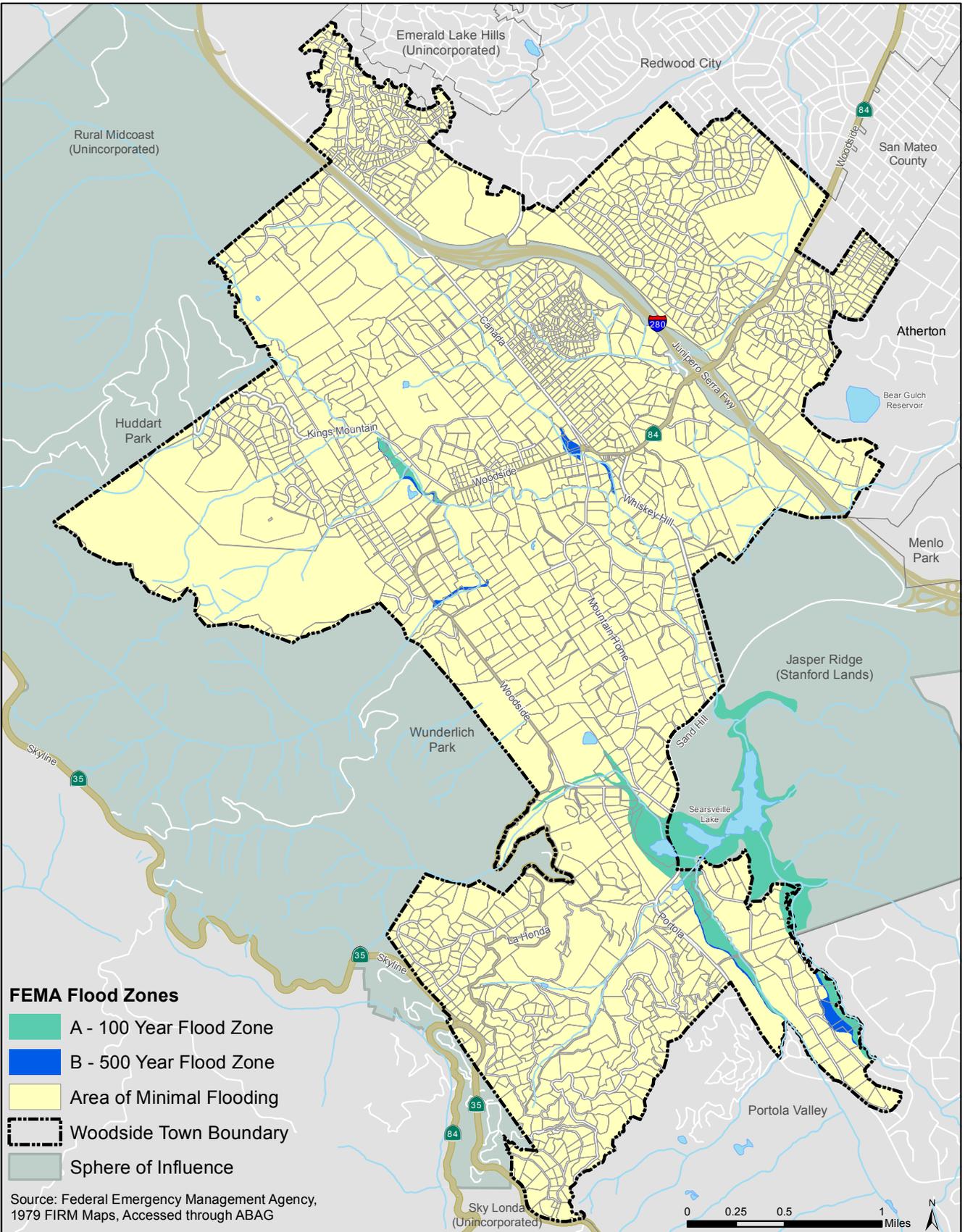
## SEICHES

A seiche is an earthquake-induced wave (sloshing) in an enclosed body of water like a lake or reservoir. A seiche can overflow or even erode an embankment, potentially releasing significant volumes of water that could flood and damage developed areas downstream. Schilling Lake is the only significant body of water in Woodside and a potentially damaging seiche could impact developed areas downstream along Dennis Martin Creek. Bear Gulch Reservoir and Searsville Lake are located outside of Woodside, and potentially damaging seiches from these sources would impact downstream undeveloped and developed areas of Stanford University, Menlo Park, and Atherton.

## SOIL LIQUEFACTION

Soil liquefaction is the phenomenon in which water saturated soil temporarily loses strength when subjected to shaking, and then flows as a fluid (in the manner of "quicksand"). Substantial damage in other areas of the world has been caused by soil liquefaction brought about by earthquakes. The State Seismic Hazards Zones maps delineate areas in Woodside that have a potential for liquefaction. While detailed geologic information for Woodside is not yet available, there is a potential for liquefaction in Hazard Zone A (Map NH1) where unconsolidated deposits and shallow groundwater conditions occur.

### Map NH3: Flood Zones



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## FIRE HAZARDS

Fire hazards in Woodside are exacerbated by the urban/wildland interface characteristics of the Town, including heavily wooded lands and large fuel loads. Further exacerbating fire hazards is Sudden Oak Death Syndrome (SODS), which kills trees, increasing fire fuel loads.

Residential development of wildlands has complicated the fire-protection mission of federal, State and local agencies. Decades of wildland fire-suppression has led to increasing fire fuel levels, percentages of dead fire fuel per wildland acre, and fuel ladders that allow fires to reach large conflagration sizes quicker and more frequently. The wildlife protection agencies are experiencing a change in the type and effects of wildland fire. Though fires are not necessarily larger, they are burning much more intensely, are more costly to control, and create greater risks and losses to the resources and citizens in the wildland areas.

### URBAN/WILDLAND INTERFACE

A review of past urban/wildland interface fires in the United States shows many common contributors to major loss of life, property, and natural resources. The most common characteristics of these fires include:

- Poor access for emergency and evacuation vehicles;
- Hot, windy, dry conditions;
- Sloping topography;
- A buildup of wildland vegetation;
- Lack of defensible space;
- Use of combustible construction materials;
- Lack of public education and information;
- Inadequate developer planning; and,
- Poorly equipped and trained firefighters.

Source: International Association of Fire Chiefs and Western Fire Chiefs Association. Development Strategies in the Wildland/Urban Interface. 1996.

## FIRE PROTECTION

The Woodside Planning Area is served by the Woodside Fire Protection District, Cal Fire, and Stanford University. The eastern portion of the Planning Area is served by the Menlo Park Fire Protection District and the Redwood City Fire Department. The Kings Mountain Fire Brigade (a volunteer fire company with a station on Skyline Boulevard) also provides fire protection in the Skyline area. All of these fire protection services fight both structural and non-structural fires, although the equipment operated by the California State Division of Forestry is designed to be most effective against grass, brush, and forest fires, rather than structural fires.

### FIRE MANAGEMENT PLAN

In response to the 2002 Albion Fire, a Fire Management Plan was commissioned in 2003 by the Town and was presented to and reviewed by the Town Council in 2003 and 2004. The 2003 Plan included findings and recommendations on fourteen topics:

- Maintenance of private properties;
- Abatement of fire hazards on private property;
- Maintenance of Town-owned properties and rights-of-way;
- Eucalyptus and other non-native trees;
- Engine company defensible space intentions;
- Woodside General Plan;
- Woodside's Site Development Ordinance;
- The Site and Building plan review process;
- Woodside's Residential Design Guidelines;
- Design Review handouts;
- Town Building Regulations;
- Woodside's Zoning Code;
- Evacuation Plans; and,
- Uniform Fire Code, 2000 Edition (2001 California Fire Code), and Fire Suppression Water Resources.

The fourteen topics that are discussed in the Plan, and the recommendations included to address the findings, can be summarized by the following statements of concern, each of which is followed by a brief summary of the status of the recommendation(s):

- Private property owners in the Town of Woodside need to be afforded a better education about the fire risks and potential liabilities they face, both as individuals and as members of the community at large. The Town and the Fire District should provide whatever assistance they can to facilitate this critical maintenance effort. The Woodside Fire Protection District should undertake a proactive and aggressive approach with the owners of private properties who fail to meet minimum maintenance standards from a fire hazards standpoint in its role as enforcement agency for the fire code. Regular records of inspections, reported code violations, and remedial actions should be kept by the District and this information should be included in the annual report of the Fire Preventions Bureau that is to be transmitted to the Fire District's Board of Directors.

Status: The Towns of Woodside and Portola Valley, in tandem with the Woodside Fire Protection District, have formed a Firewise Committee (discussed later in this Element) which addresses a broad array of fire safety and prevention topics. Jointly sponsored workshops that provide an opportunity for property owners to learn how to identify fire hazards and how to mitigate against them are offered regularly. The fire district has undertaken an annual inspection program of properties within its jurisdictional boundaries and visits about one-third of all properties each year, providing direction to the property owners about maintenance efforts that must be taken to reduce or eliminate fire risks. Regular reports of the district's efforts are provided to the fire district board and to the Firewise Committee.

- The Town should adopt an annual and ongoing clean-up program to minimize or eliminate fire fuel accumulations on Town-owned properties and in

the public rights-of-way. It is crucial that the Town set an example for all other property owners in Town by proactively addressing its own fire safety hazards.

Status: The Town has developed a program that is an annual component of the Town maintenance crew's Work Plan. Under guidance from the Fire Marshal, the crew clears fire fuel from Town properties and rights-of-way, using the Fire Marshal's priority ranking. In addition to addressing Town-owned properties, the Town has also established a "Defensible Space Matching Fund Program" whereby private property owners are encouraged to undertake clean-up projects on their properties and to apply for a Town grant to offset half the cost, up to a total project cost of \$2,000.

- The Town should examine all of its regulations and policies and decide, through a deliberate and open discussion involving the full community, how to modify its many public documents to ensure that sound fire safety and prevention practices and policies are provided the highest priority among competing objectives, as espoused by the General Plan, Municipal code and supporting documents. The issue of fire safety versus aesthetics should receive special focus. Building Regulations should be upgraded to meet higher fire safety standards, including those governing roofing assemblies and coverings on all structures. Acceptable landscaping materials should be limited to those that are fire resistive and the density of landscaping materials should be limited. The Town's building and design standards should better incorporate fire safety considerations.

Status: The Town is currently revising its Residential Design Guidelines and is including special consideration of fire prevention matters, including fire resistive materials and less dense landscaping. This General Plan Update has been developed with a special emphasis upon fire safety matters and the Town's Municipal Code has been modified to include stringent fire safety regulations for all properties within the Town (see the next section).

## Historic Fire Management

The Ohlones, like most other California Indians, periodically burned their land. They did it deliberately, and by so doing they profoundly altered the ecology of the Bay Area. Their repeated burning had many different effects: it kept the brush from taking over the meadowland; it helped perpetuate the digger pines (a source of delicious, highly valued pine nuts) whose seeds germinate best after a fire; it fostered certain grasses and flowers which the Ohlones found desirable; it provided a good wildlife habitat for large game animals such as elk, deer, and antelope; and it prevented the build-up of fuel which might eventually have caused a truly disastrous forest fire.

Thus the first explorers who so lyrically and enthusiastically described the "park-like" forests and open meadows of the Bay Area had not stumbled upon a virgin wilderness untouched by human hands. Far from it. They had instead entered a landscape that had been consciously and dramatically altered for centuries. Amazingly, the splendid landscape and bountiful wildlife of the Bay Area existed not despite human presence, but (at least to some extent) because of it.

Source: Margolin, Malcolm. *The Ohlone Way*. Berkeley: Heyday Books, 1978.

## TOWN FIRE ZONES AND REGULATIONS

In response to the Fire Management Plan and State mandates, the Town of Woodside designated higher fire hazard areas and adopted more stringent fire prevention regulations.

In 2008, the Woodside Town Council adopted an ordinance which designated the western foothills and Emerald Hills as "Very High Fire Hazard Severity Zones" (VHFHSZ). These zones were developed by the Cal Fire State Fire Marshal, and were reviewed and adopted as proposed by the local Fire Marshal.

In 2009, the Woodside Town Council adopted Ordinance 2009-544, designating new regulations incorporating fire resistive materials and construction methods for the entire Town. Additional site improvement and defensible space requirements apply to properties located in the VHFHSZ.

## CHIPPER PROGRAM

In response to the recommendation of the Fire Management Plan, the Chipper Program is a local fire prevention effort administered by the Woodside Fire Protection District (WFPD) in conjunction with the Towns of Woodside and Portola Valley. Established in 2005, the Chipper Program is a fuel reduction program to help decrease the communities' threat from wildfire. With a grant from the Fireman's Fund, WFPD purchased a wood chipper, which is used to chip vegetation removed by homeowners. The chipper enables the Fire District to easily dispose of large amounts of fuel. Chipping occurs during the non-rainy season for a two to three day period for each neighborhood area. Chipping labor is provided through San Mateo County Fire Safe & CDC inmate crews. Residents place materials for chipping roadside. The service is provided at no charge.

## PG&E TREE TRIMMING PROGRAM

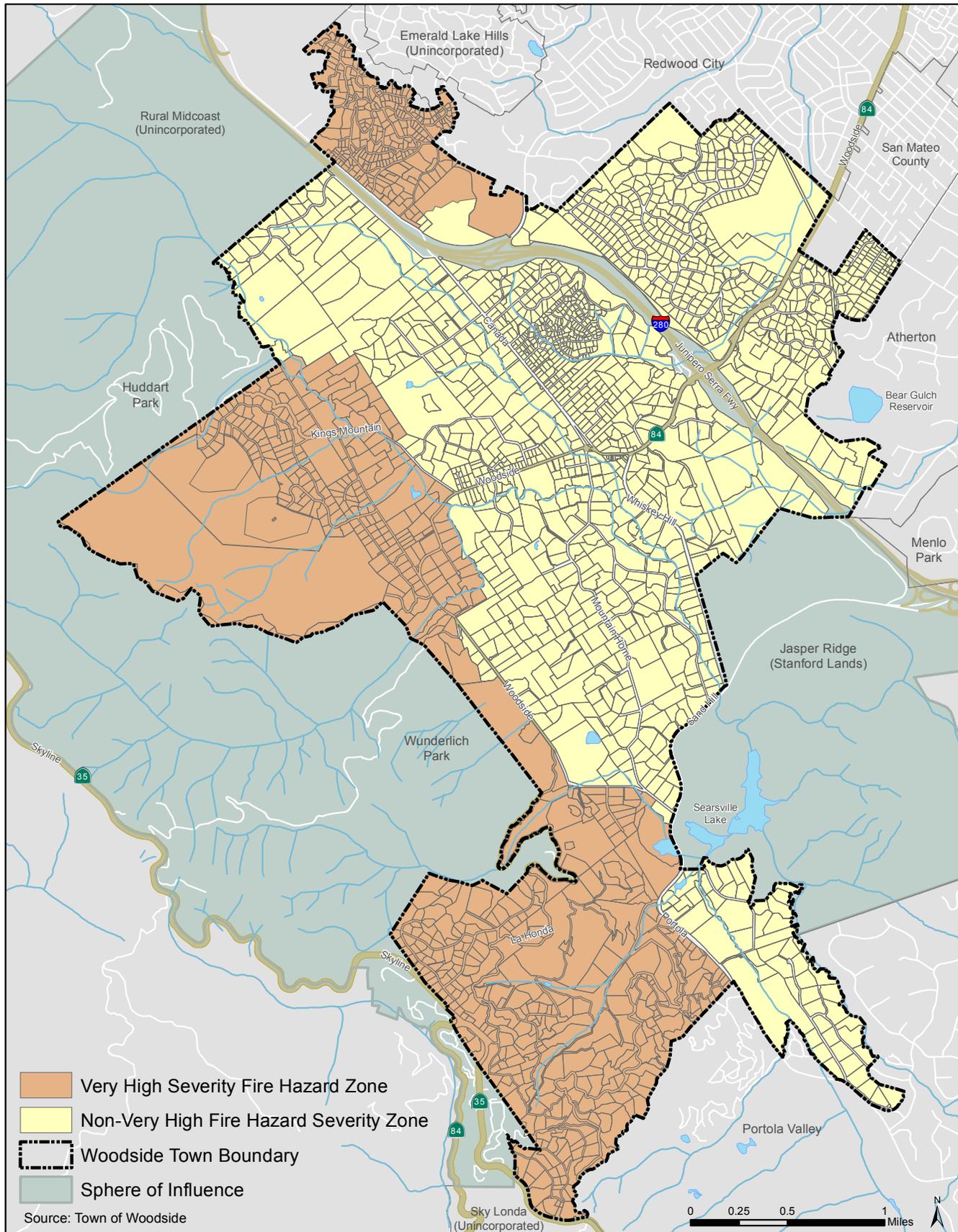
In order to reduce the risk of electrical fires, PG&E trims trees near power lines annually.

## AD HOC FIREWISE COMMITTEE

In 2009, the Ad Hoc Firewise Committee was formed. Committee membership includes Woodside and Portola Valley elected officials, fire district and Town staff. The Mission Statement of the Committee is as follows:

"The mission of the Firewise Advisory Committee is to identify, recommend, and assist with the implementation of a plan designed to increase the readiness of the residents of the Woodside Fire Protection District to protect life, property, and the environment from the threat of wildfire. This mission is accomplished through educating our residents about the dangers of wildfire, fuel mitigation, and the creation and adoption of firewise building codes. This mission is further accomplished by supporting pre-existing disaster preparedness groups and regional fire safety programs within the community."

Map NH4: Very High Severity Fire Hazard Zone



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Accomplishments to date of this Committee includes periodic community workshops on mitigating fire hazards, development of the defensible space matching fund program, and formulation of fire safety regulation recommendations.

### **IMPACT OF URBAN/WILDLAND INTERFACE ON CONSERVATION PLANNING**

Fire prevention regulations, as well as other development standard regulations, can conflict with conservation planning efforts. For example, a residence built at the minimum required setback from a riparian area could result in the removal of riparian vegetation to create a defensible space zone around the residence. The optimal approach to achieving a greater balance between such conflicting goals is to specifically identify all areas to be preserved (including the appropriate buffer zone), and restrict development of these areas. This approach would, however, require the collection of a wide range of data to identify and select the preserve areas. An alternative to completion of such an in-depth study is preparation of Urban/Wildland Interface Design Guidelines. Such guidelines could inform the design process as individual development projects are reviewed.

### **URBAN/WILDLAND INTERFACE DESIGN GUIDELINES**

In developing guidelines for urban/wildland interfaces, the specific habitats' covered wildlife species of interest should be identified to ensure that these species have sufficient habitat to live and forage, free from the need to disperse from preserve areas into surrounding developed areas where they can fall prey to domestic animals; human-habituated wildlife species such as raccoons and opossums that thrive in urban and residential areas; and motor vehicles.

Beyond minimizing such direct and immediate impacts, the design of the urban/wildland interface should consider indirect and long-term effects, such as runoff from developed areas that can transport harmful substances (such as pesticides, automotive fluids, sediment) into

preserves; establishment of invasive nonnative species that can disperse from nearby landscaped areas; and structural and biological damage (such as soil compaction, creation of unauthorized trails, disturbance of sensitive species) that can result from unmanaged human access and use.

Specific design guidelines should address: fencing; lighting; trails; and site planning issues, such as native landscaping, fuel modification at preserve boundaries, and sediment and erosion control.

## ACCEPTABLE RISK

This section (a) defines the term “acceptable risk,” (b) classifies various structures, occupancies, and land uses for the purpose of risk analysis, and (c) establishes general limits for “acceptable risk” from specified hazards for each class of structure, occupancy, or land use.

### (A) DEFINITION

The term “acceptable risk” is used to describe the level of risk that the majority of citizens and insurance companies will accept without asking for governmental action to provide protection. To illustrate this point, consider a site subject to occasional flooding. If the chances are one in a thousand that the site will be flooded in any given year, local citizens will probably accept that risk without asking for governmental protection. However, if the chances of flooding are one in ten, citizens may ask that either governmental regulations be enacted to prohibit people from building homes on the site (in order to protect life and property), or that government build protection devices to control the flood waters.

### (B) RISK RATINGS

Table NH3 lists structures and land uses for the purpose of risk classification. Exposure of the critical facilities to frequent, or occasional hazard, is not tolerable because the possibility of injuries to persons and losses of life and property or disruption of disaster response capabilities could be so great in the event of damage to any of these facilities. On the other hand, a greater probability of damage to non-critical facilities can be tolerated because exposure to the hazard either affects relatively few people or properties, or causes relatively little personal injury or property damage.

Table NH4: Levels of Acceptable Risk for Various Types of Structures, Occupancies, and Land Uses, classifies the structures, occupancies, and land uses described in Table NH3 and establishes general levels of Acceptable Risk in terms of risks to health and safety, risks to continuity of service, and risks of fire or structural damage. The

column in Table NH4 titled “Level of Acceptable Risk” identifies the general levels of risk that are considered appropriate for each category of structure, occupancy, or land use. The basic premise for this table is that the Town wishes to avoid all loss of life from foreseeable hazards, and to prevent personal injury and reasonably avoidable property damage.

Acceptable damage to facilities is correlated with risk levels and provides a guide to structural design requirements for all facilities and fire resistant characteristics for buildings in the several risk classes. Table NH5: Location of Structures and Land Uses in Relation to Defined Hazard Areas, is a general guide to siting development with respect to the various hazard areas.

### (C) CRITICAL FACILITIES

The term “critical facilities” is used to describe those structures, or uses of land which are especially important for the preservation of life, the protection of property, and the continuing functioning of society. For the purposes of planning for hazard avoidance or mitigation, structures, occupancies, and land uses in the Woodside Planning Area are classified as indicated in Table NH3: Risk Classification of Structures, Occupancies and Land Uses. Classes 1-A through 3-B in this table are considered to be “critical facilities” in the Woodside Planning Area. Examples in the Woodside Planning Area are the San Francisco Water Department’s aqueducts, and the PG&E high pressure gas transmission lines. These are of great importance to many residents in the Bay Area and are considered to be “critical facilities.”

**Table NH3: Risk Classifications of Structures, Occupancies, and Land Uses**

Class	General Category	General Examples*	Woodside Examples
1-A	Facilities whose failure might be catastrophic	Nuclear reactors, large dams	None
1-B	Facilities whose continuing function is critical	Power plants, power intertie systems	S.F. Water Department Aqueduct PG&E 220KV power transmission PG&E natural gas transmission lines
2-A	Facilities critically needed for services after disaster	Hospitals, fire stations, telephone exchanges	Woodside Fire Station State Division of Forestry Fire Station
2-B	Critical transportation links	Regional highways, bridges, rail lines, overpasses, tunnels	Interstate Freeway 280 Woodside Road - La Honda Road Sand Hill Road, Portola Road
2-C	Major local utility lines and facilities	Power substations, gas and water mains	PG&E electric substations 12 and 4KV power lines California Water transmission lines Gas lines
2-D	Small dams	Small dams	Searsville Lake Dam Deer Gulch Reservoir
3-A	High occupancy structures	High-rise apartments and offices, schools	Woodside Elementary School Woodside High School Cañada College
3-B	Facilities highly desirable for shelter after disaster	Schools, churches	Cañada College Woodside Library Local Schools Local Churches
3-C	Local roads, utilities and communication facilities	Local roads, local utility lines	Local Roads and Bridges Local Utility Lines Telephone Services
4-A	Medium occupancy structures	Most commercial and industrial buildings, apartments	Town Center Buildings
4-B	Low occupancy structures	Single family homes	Single family homes
5-A	Open space lands with intensive development or high intensity occupancy	Recreation areas, orchards, vineyards	Menlo Country Club Golf Course Mounted Patrol grounds Huddart Park Barkley Fields and Park
5-B	Open space lands, with no developed lands, low intensity occupancy	Grazing lands, forests	Hillside open space Open fields

Critical Facilities

\*Some of the general examples given in this table are for purposes of illustration only, and are not anticipated in the Woodside Planning Area.

Source: Town of Woodside

**Table NH4: Levels of Acceptable Risk for Structures, Occupancies, and Land Uses**

Class	General Category of Structure, Occupancy, or Land Use	Population Affected in Event of Failure or Destruction	Acceptable Damage to Facility	Tolerance for Risk*
1-A	Facilities whose failure might be catastrophic	vast	None which would result in exposing affected population to death or injury	Near zero
1-B	Facilities whose continuing functioning is critical	vast	None which would impair facility or disrupt function	Extremely low
2-A	Facilities critically needed after disaster	substantial	None which would impair facility or disrupt function	Extremely low
2-B	Critical transportation links	substantial	Minor non-structural; facility should remain operational and safe, or be susceptible to quick restoration of service	Low
2-C	Major local utility lines and facilities	substantial	Minor non-structural; facility should remain operational and safe, or be susceptible to quick restoration of service	Low
2-D	Small dams	moderate	None which would expose "downstream" population to injury	Extremely low
3-A	High occupancy structures (schools, churches)	varies	No structural damage; minor non-structural damage, but structures should remain safe and usable	Low
3-B	Facilities highly desirable for shelter after disaster	varies	No structural damage; minor non-structural damage, but structures should remain safe and usable	Low
3-C	Local roads, utilities, communication facilities	moderate	Damage should be susceptible to reasonably rapid repair (or utility shut-off)	Moderate
4-A	Medium occupancy structures (commercial buildings)	moderate	Structural integrity must be retained; (structure should not collapse); damage should not unduly endanger safety of occupants.	Low
4-B	Low occupancy structures	few	Structural integrity must be retained; (structure should not collapse); damage should not unduly endanger safety of occupants.	Ordinary
5-A	Open space lands, with intensive development, or high intensity occupancy	varies	Structural integrity must be retained; (structure should not collapse); damage should not unduly endanger safety of occupants.	Moderate
5-B	Open space lands, no developed areas, low intensity occupancy	few	Not applicable	High

Critical Facilities

\* Levels of acceptable risk range from lowest to highest as follows: Near zero, Extremely Low, Low, Ordinary, Moderate, and High  
 Source: Town of Woodside

**Table NH5: Location of Structures and Land Uses in Relation to Defined Hazard Areas**

General Category of Structure, Occupancy, or Land Use		Hazards														
		Fire		Flood		Earth Shaking				Surface Faulting						
		Non-Very High Severity Fire Hazard Zone	Very High Severity Fire Hazard Zone	Subject to Annual Flooding	Prone to Occasional Flooding	Seismically-Induced Landsliding	Seismically-Induced Liquefaction	All other locations in the Woodside Planning Area	Within 50 ft. of active fault trace	Within 125 ft. of potentially active fault trace	Steep Slopes (>35%)	Landslides/Slope Instability	Earth Settlement	Expansive Soils/Bedrock	Shallow Groundwater	
Critical Facilities	1-A	Facilities whose failure might be catastrophic	OK	X	X	X	X	X	X	X	X	M	M	M	M	
	1-B	Facilities whose continuing functioning is critical	OK	X	X	X	M	X	X	X	X	M	M	M	M	
	2-A	Facilities critically needed after disaster	OK	X	X	X	M	X	X	X	X	M	M	M	M	
	2-B	Critical transportation links	OK	M	M	M	M	M	M	M	X	M	M	M	M	
	2-C	Major local utility lines and facilities	OK	M	M	M	M	M	M	M	X	M	M	M	M	
	2-D	Small dams	OK	M	M	M	M	M	X	M	X	M	M	M	M	
	3-A	High occupancy structures (schools, churches)	OK	X	X	X	M	M	M	X	M	X	M	M	M	M
	3-B	Facilities highly desirable varies for shelter after disaster	OK	X	X	X	M	M	M	X	M	X	M	M	M	M
	3-C	Local roads, utilities, communication facilities	OK	M	X	M	M	M	M	M	M	X	M	M	M	M
	4-A	Medium occupancy structures (commercial buildings)	OK	M	X	X	M	M	M	X	M	X	M	M	M	M
	4-B	Low occupancy structures	OK	M	X	X	M	M	M	X	M	X	M	M	M	M
	5-A	Open space lands, with intensive development, or high intensity occupancy	OK	OK	M	M	OK	M	M	OK	OK	X	M	M	M	M
	5-B	Open space lands, no developed areas, low intensity occupancy	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

OK - Use usually OK without special design or construction measures required

M - Use may be appropriate if mitigating measures are taken adequate to the function of structure or occupancy

X - Use is usually NOT APPROPRIATE in a location with these characteristics

Source: Town of Woodside

# GOAL NH1

Minimize risks posed by hazards.

The goal of the Natural Hazards and Safety Element is to minimize the risk from identified hazards.

## POLICY NH1.1 – REGULATE LAND USE AND DEVELOPMENT TO PROTECT LIVES AND PROPERTY

The Town shall regulate land use and development to avoid or mitigate the effects of natural hazards in order to protect lives and property.

### 1. Appropriate Land Uses

Table NH3, Risk Classifications of Structures, Occupancies, and Land Uses, ranks the reliance on various structures, occupancies, and land uses to support health, safety, and welfare. The scale ranges from 1 to 5; with 1 being the most important to health, safety, and welfare, and 5 being the least.

Table NH4, Levels of Acceptable Risk for Structures, Occupancies, and Land Uses, describes the scale of population effect associated with the loss or failure of various structures, occupancies, and land uses; acceptable damage to the facility; and tolerance for risk. From low to high impact on health safety and welfare, population effect is expressed as “few” to “vast”, acceptable damage to facility as “not applicable” to “none”, and tolerance for risk as “high” to “near zero”.

Table NH5, Location of Structures and Land Uses in Relation to Defined Hazard Areas, provides a general guide to acceptable locations of structures and land uses in relation to defined hazards.

These tables provide a basis for reviewing existing or proposed structures and land divisions for consistency with policy set forth in this Element.

### 2. Limit Development

Land divisions and development on lands shall be designed and constructed in such a manner that levels of “acceptable risk” defined in Table NH4 are not

exceeded. Development in hazardous areas shall, in general, be limited to structures and improvements which would not threaten human life, or cause substantial financial loss in the event of damage. Where hazards are identified, mitigating measures should be taken at the time of development. Mitigation measures could include providing adequate fire egress from the development, and ensuring that there are no lengthy, one-way streets. Development shall provide adequate water supplies, roads which are suitable for the safe passage of emergency vehicles, and legible street-name signs and house numbers.

### Strategies:

#### a. Update Regulations

Regulations shall be regularly reviewed and updated to ensure:

1. the intensity of development in hazardous areas is reduced;
2. the scope of hazard “mitigation measures” that should be taken by type of land use is clearly defined;
3. requirements for geotechnical and geologic investigations to identify and mitigate geologic hazards are provided;
4. procedures for the review of geotechnical and geologic reports submitted for development are provided;
5. fire safety of building construction is improved; and,
6. defensible space is defined and its benefits balanced with Town conservation goals.

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## **POLICY NH1.2 – REQUIRE ASSESSMENT AND MITIGATION OF SEISMIC HAZARDS**

The Town shall seek to minimize the risk associated with seismic hazards by requiring adequate geotechnical and geologic reports, developing acceptable minimum engineering standards, and requiring that structures be sited appropriately.

### **1. Geotechnical and Geologic Investigations**

Geotechnical and geologic investigations shall be made and reports submitted in connection with applications for development in locations where there may be a substantial threat to life or property because of potential hazards.

### **2. Regulating Near Faults**

Structures for human occupancy shall not be located on, or within, the required setbacks from active or potentially active fault traces.

All active and potentially active faults shown on the Town Fault Map shall be considered active, unless evidence to the contrary is developed through field investigations. These field investigations are compiled on an in-house map which should be updated as new information becomes available.

Fault traces categorized as inactive including the Pilarcitos Fault, and unnamed faults in the Woodside Glens, Woodside Hills and the Edgewood Road areas, shall be considered in the review of applications for the construction of buildings for human occupancy, site development, land divisions, and subdivisions. Appropriate geologic investigations shall be made and reviewed to determine their location and characteristics prior to the approval of any such applications.

### **3. Geotechnical Engineering Standards**

Construction in hazardous areas shall be built according to the minimum acceptable geotechnical engineering standards.

### **4. Earthquake Safe Design**

The Town implements the California Building Code (CBC) that is adopted and promulgated by the State of California for use statewide by local enforcement agencies. The CBC sets forth minimum standards for the design and construction of all structures to resist the effects of the design earthquake ground motions. Every structure and portion thereof, including nonstructural components, shall be designed and constructed to resist the effects of earthquake motions in accordance with the adopted California Building Code (and the referenced ASCE-7 standard).

### **5. Critical Facilities**

Critical facilities in the Woodside Planning Area, as defined in Table NH5, shall be designed and constructed to resist the effects of the design earthquake ground motion in accordance with the adopted California Building Code for Occupancy Category-IV (as assigned in the CBC Table 1604.5), without sustaining damage in excess of the acceptable levels specified in Table NH4, or as specified in the adopted California Building Code, whichever is more restrictive. No critical facility shall be located on an active fault, within the required fault setback, or in areas with potential geologic and seismic hazards, unless a geotechnical and geologic report indicates to the satisfaction of appropriate Town officials that mitigating measures are feasible and that sufficient measures will be taken to reduce both seismic and non-seismic hazards to acceptable levels of risk.

### **6. Structural Review of Critical Facilities**

The structural integrity of all existing Town-owned critical facilities (Tables NH3 and NH4) shall be reviewed. Those critical facilities which are unable to meet Policy NH1.2.4 shall be strengthened or removed. The Town shall encourage property owners of critical facilities to do the same.

### **7. Utility Lines**

Special design and construction techniques shall be promoted to assure a high degree of safety and permanence in those instances in which utility lines must cross faults and fault zones.

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## Strategies:

### a. Geotechnical and Geologic Reports

Maintain an electronic record of geotechnical and geologic reports received by the Town.

### b. Update Town Maps

The results of such reports will be utilized to supplement and supersede more general information and update the Map NH2, Town Fault Zones Map and Map NH1, Town Geologic Hazards Map.

### c. Update Regulations

Update Town regulations as needed to specify how fault traces are to be identified and what setback distances are appropriate from fault traces.

## POLICY NH1.3 – REQUIRE ASSESSMENT AND MITIGATION OF LANDSLIDE HAZARDS

The Town shall seek to minimize the risk associated with landslide hazards by requiring adequate geotechnical and geologic reports, requiring that structures be appropriately sited, and requiring special design and construction techniques.

### 1. Assessment of Landslide Risk

All proposed development shall be reviewed against the geotechnical and geologic reports, and shall be responsive to the information and requirements indicated on Map NH2, Town Fault Zones Map; Map NH1, Town Geologic Hazards Map; and State Seismic Hazards Zone Maps.

### 2. State Highways and Local Roads

Special design and construction techniques shall be promoted to assure a high degree of safety and permanence in those instances in which highways and roadways must cross landslide areas.

### 3. Utility Lines

Special design and construction techniques shall be promoted to assure a high degree of safety and permanence in those instances in which utility lines must cross landslide areas.

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## Strategies:

### a. Update Regulations

Update Town regulations as needed to address site-specific setbacks from known or potential landslide-prone areas and landslide repairs.

### b. Interjurisdictional and Interagency Cooperation

Work cooperatively with CalTrans and public utility companies to promote a high degree of safety and permanence in those instances in which State roads and utility lines must cross landslide areas.

## POLICY NH1.4 – REQUIRE ASSESSMENT AND MITIGATION OF GROUND SETTLEMENT RISKS

The Town shall seek to minimize the risk associated with ground settlement by requiring adequate geotechnical and geologic reports, and requiring appropriate mitigation measures.

### 1. Assessment of Ground Settlement Risks

In areas of unconsolidated and surficial deposits (Hazard Zone A on Map NH1, Geologic Hazards Map) and landslide deposits (Hazard Zones B, B1, B2 on Map NH1) and fill, geotechnical and geologic reports shall be submitted in connection with all applications for development; such reports should evaluate the potential for ground settlement.

### 2. Mitigation

Where potential for ground settlement is found, measures necessary to avoid or mitigate the probable effects of this hazard should be employed.

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## Strategies:

### a. Update Regulations

Update Town regulations as needed to address site-specific mitigation for ground settlement risks.

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## POLICY NH1.5 – REQUIRE ASSESSMENT AND MITIGATION OF SOIL LIQUEFACTION RISKS

The Town shall seek to minimize the risk associated with soil liquefaction by requiring adequate geotechnical and geologic reports, and requiring appropriate mitigation measures.

### 1. Assessment of Soil Liquefaction Risks

In Hazard Zone A (Figure NH2) and in liquefaction zones on the State Seismic Hazards Zone Maps, geotechnical and geologic reports shall be submitted in connection with all applications for development. Such reports should evaluate the potential for liquefaction.

### 2. Mitigation

Where potential for liquefaction is found, measures necessary to avoid or mitigate the probable effects of the hazard shall be employed.

### Strategies:

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#### a. Update Regulations

Update Town regulations as needed to address site-specific mitigation for soil liquefaction risks.

## POLICY NH1.6 – REQUIRE ASSESSMENT AND MITIGATION OF FLOOD HAZARDS

The Town shall seek to minimize the risk associated with flood hazards by requiring that structures be sited appropriately, prohibiting structures which impede flood waters, requiring flood control measures, requiring maintenance of appropriate vegetation, and prohibiting the placement and accumulation of debris that impedes flood waters.

### 1. Floodway

No structure which would impede the flow of flood waters shall be erected in a floodway.

### 2. Flood Areas

No structures, other than minor accessory structures and structures for creek bank stabilization, shall be erected in an area subject to flooding.

### 3. Preventative Maintenance

Owners of buildings which are in flood prone areas, as designated by the current FEMA Flood Zones Map, and other areas designated by the Town, shall take appropriate measures to reduce the likelihood of flood damage to their property. Any such measures shall be controlled so as to not increase the flood or erosion hazards.

### 4. Vegetation

Appropriate vegetation should be maintained to minimize the runoff of rainfall, consistent with other safety practices.

### 5. Floodway Debris

No debris that would impede the flow within the floodway shall be placed or allowed to remain in a floodway.

### 6. Permit Responsibility

It shall be the responsibility of private property owners to contact and obtain all required permits for work within riparian area, including those required by California Department of Fish and Game, United States Fish and Wildlife Service, and United States Army Corps of Engineers.

### Strategies:

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#### a. Monitoring

Continue the Town's practice of monitoring floodways along rights-of-way for potential impediments, especially immediately prior to and during the rainy season.

#### b. Development Review

Continue to review development within flood prone areas to reduce the likelihood of flood damage to individual properties.

#### c. Annual Review

Annually review those areas covered by the General Plan that are subject to flooding identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or Department of Water Resources.

## POLICY NH1.7 – SEEK TO MINIMIZE EROSION AND SEDIMENTATION

The Town shall seek to minimize the risk associated with erosion and sedimentation by requiring the maintenance and restoration of appropriate vegetation, and minimization of impervious areas on a site.

Natural slopes shall be maintained and existing vegetation preserved to the fullest extent possible, especially in hillside areas. When there is any significant change in natural grade or removal of existing vegetation, remedial measures should be employed to restore or provide appropriate vegetative cover and to control storm water runoff. This policy should be balanced with the need for fire safety.

Development plans should also minimize paved coverage to reduce the amount of site runoff, which can cause increased erosion and sedimentation.

### Strategies:

#### a. Monitoring

Continue the Town's practice of noticing all property owners with active development permits, and other known sites which may have been devegetated, of rainy season erosion control requirements prior to each rainy season.

#### b. Update Regulations

Update Town regulations as needed, such as those related to paved coverage, natural state requirements, and grading, to reduce erosion and sedimentation.

## POLICY NH1.8 – REQUIRE ASSESSMENT AND MITIGATION OF EXPANSIVE SOILS RISKS

The Town shall seek to minimize the risk associated with expansive soils by requiring adequate geotechnical and geologic reports, and requiring any appropriate mitigation measures.

### 1. Assessment of Expansive Soils Risks

In areas on Map NH1, Town Geologic Hazards Map,

where information available to Town officials indicates the potential of expansive soils or bedrock, geotechnical reports shall be submitted in connection with all applications for development.

### 2. Mitigation

Where the presence of expansive soils or bedrock is confirmed, geotechnical, structural, drainage and other measures necessary to mitigate the probable effects of this hazard should be employed.

### Strategies:

#### a. Update Regulations

Update Town regulations as needed to address site-specific measures to mitigate the risk of expansive soils.

#### b. Update Map

Update the Town Geologic Hazards Map on a periodic basis as new information becomes available.

## POLICY NH1.9 – REQUIRE ASSESSMENT AND MITIGATION OF FIRE HAZARDS

The Town shall seek to minimize the risk associated with fire hazards by requiring adequate defensible space, fire resistant materials, adequate fire protection, and the appropriate siting of structures.

### 1. Clearance around Structures

Adequate clearance and vegetation control around structures (defensible space) shall be maintained by the property owner to prevent the spread of fire by direct exposure, and to assure adequate access for fire suppression.

### 2. Fire Safe Design and Materials

New buildings that are located in a designated Very High Fire Hazard Severity Zone shall be designed and constructed to comply with the special requirements that are provided in the California Building Code, including vegetation management for the property, which shall be performed in accordance with the California Fire Code.

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New buildings that are not located in a designated Very-High Fire Hazard Severity Zone, shall be designed and constructed to comply with the Town's special fire safety construction requirements that are established in the Town's Municipal Code.

### 3. Remodeled buildings

Remodeled buildings town-wide shall be designed and constructed to comply with the Town's special fire safety construction requirements that are provided in the Town's Municipal Code.

### 4. Protective Measures

In areas designated by the Town of Woodside as a Very High Fire Severity Hazard Zone (Map NH4), as well as within other areas that are identified as presenting a high fire hazard, special protective measures shall be provided for vegetation management in order to control the spread of a wildfire in accordance with the California Fire Code.

### 5. Water Supply

Where water supply in existing subdivided areas does not meet current standards for fire flow, all reasonable measures for improvement shall be pursued.

### 6. Protecting Structures

Owners of habitable buildings and critical facilities in areas classified as Very High Fire Hazard Severity, should take reasonable measures to minimize their risk by providing defensible space, fire resistant materials, adequate fire protection, and appropriate siting of new structures.

### 7. Planning Commission Review

Prior to the approval of any lot line adjustment or division of lands classified as Very High Fire Severity Hazard, the Planning Commission shall review the proposed means of

providing adequate fire protection.

## Strategies:

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### **a. Education**

Provide public information regarding fire resistant building materials, landscaping, and defensible space (which addresses and balances fire safety and environmental conservation).

### **b. Update Regulations**

Update Town land use, site development, and land division regulations as needed, to ensure consistency with current fire regulations.

### **c. Update Guidelines**

Review the Residential Design Guidelines to ensure consistency with current fire regulations, such as the requirement for fire-resistant building materials and defensible space.

### **d. Water Supply and Pressure**

Identify areas with inadequate water supply and pressure for fire protection and work with water purveyors to prioritize needed improvements.

### **e. Fire Safety Programs and Planning Efforts**

Promote fire safety and planning efforts, such as the Chipper Program and the Ad Hoc Firewise Committee.

### **f. Urban/Wildland Interface Design Guidelines**

The Town shall consider developing urban/wildland interface design guidelines to balance the needs of fire safety and environmental conservation.

## POLICY NH1.10 – COMPILE AND MAINTAIN NATURAL HAZARD DATA

The Town shall compile and maintain natural hazard data for the various parts of the Planning Area to be used for risk avoidance in new construction, for risk abatement in existing development, and to protect lives and property.

### Strategies:

#### **a. Town Fault Map (Source: USGS and Town Geologist)**

Maintain a Town Fault Map. Reference Map NH3 (USGS) and in-house trenching map.

#### **b. Town Geologic Hazards Map (Source: Town Geologist)**

Maintain a Town Geologic Hazards Map. Reference Map NH1.

#### **c. USDA Soils Data (Source: USDA)**

Maintain on file current USDA soils data.

#### **d. Maintain Geotechnical and Geologic Reports (Source: Applicants' Submittals)**

Maintain a hard copy and electronic file of all site specific geotechnical and geologic reports, and update the Town Geologic Map and Town Geologic Hazards Map accordingly.

#### **e. Flood Map (Source: FEMA)**

Maintain on file the current FEMA flood maps. Reference Map NH2.

#### **f. Very High Fire Hazard Severity Zone Map (Source: Cal Fire)**

Maintain on file the current Very High Fire Hazard Severity Zone Map. Reference Map NH4.

## POLICY NH1.11 – INSTITUTE OR PARTICIPATE IN EDUCATION RELATED TO NATURAL HAZARDS

The Town shall institute, or participate in, community education programs and information which aid the community in minimizing the risks associated with natural hazards.

### Strategies:

#### **a. Community Education Programs and Information**

Institute, or participate in, and publicize relevant community education and information programs which increase public awareness of seismic, geologic, storm, flood and fire hazards.

#### **b. Utilize Website**

Utilize the Town website as a forum for disseminating natural hazard information.

#### **c. Cooperate with Other Jurisdictions, Agencies, and Organizations**

Cooperate with other jurisdictions, agencies and organizations in providing community education and information programs, and sharing natural hazards information.

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# EMERGENCY PREPAREDNESS

## INTRODUCTION

Local governments, including the Town of Woodside, are charged with the responsibility to provide effective emergency preparedness operations under State law and Federal Emergency Management Administration (FEMA) directives. This responsibility requires the Town to ensure the effective direction of resources involved in preparing for and responding to situations associated with natural disasters, man-made technological incidents, or national defense emergencies. The Town must be prepared to respond to emergencies that might occur within its corporate limits and must be able to assess whether its capabilities are sufficient to respond effectively. The Woodside Municipal Code includes a chapter devoted to Emergency Services. The stated purpose of the chapter is “to provide for the preparation and carrying out of plans for the protection of persons and property within the Town in the event of an emergency; the direction of the Emergency Organization; and the coordination of the emergency functions of the Town with all other public agencies, corporations, organizations, and affected private persons.” Emergency is broadly defined as the “actual or threatened existence of conditions of disaster or of extreme peril to the safety of persons and property within the Town caused by such conditions as air pollution, fire, flood, storm, epidemic, riot, earthquake, or other conditions, including conditions resulting from war or the imminent threat of war.” The Town Manager is designated as the Town’s Director of Emergency Services.

The Town is required to prepare and maintain an Emergency Plan and to designate an Emergency Operations Center (EOC). Town staff is required to receive

regular emergency response training in order to qualify for federal and State disaster relief and reimbursement. Emergency preparedness planning for the Woodside area is based on the premise that local emergencies will be dealt with quickly and effectively by local forces, such as local fire protection services, the County Sheriff, and local health services. The assumption is also made that any major disaster or emergency will require outside assistance, from nearby cities, the County, the State, or from federal sources. Woodside is aware that if an emergency situation affects a wide geographical area (as an earthquake might), that the densely populated areas will probably receive aid first, and that rural areas, such as Woodside, will receive attention only when and if it becomes available.

The Town’s Emergency Preparedness Program addresses the three critical aspects of a disaster: preparedness, response, and recovery. An effective plan emphasizes mitigation programs to reduce vulnerabilities and disaster and preparedness activities to ensure that the capabilities and resources are available for an effective response. To assist the Town government and the community to recover from the disaster, the plan should outline programs that promote a return to normalcy.

The specific objectives of the Town’s Emergency Plan, once a disaster occurs, are to facilitate:

- Treating injuries and protecting property;
- Overall management and coordination of emergency operations;
- Coordination with appropriate local, State, and federal governmental agencies; and private sector resources;
- Management of mutual aid;
- Establishment of priorities and completion of action plans;
- Collection, evaluation, and dissemination of damage information and other essential data; and,
- Provision of emergency information to the public.

Effective plans address a broad array of topics, including but not limited to:

- The provision of firefighting, rescue, law enforcement, and medical services;
- The identification of trained personnel (first aid, nurses, and doctors), ambulance services, and the availability of hospitals;
- The stockpiling of medical supplies;
- The availability of emergency shelters;
- The provision of emergency food supplies and water;
- The availability of communications networks;
- The location and contact information for public and private utilities; and,
- Public information plans.

Interaction with organized local neighborhood organizations is also a key topic, as outlined in the next section.

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## CITIZENS' EMERGENCY RESPONSE AND PREPAREDNESS PROGRAM (CERPP)

In the fall of 1997, the Woodside-Portola Valley Rotary Club, with the assistance of the Woodside Fire Protection District, launched the concept of CERPP, a neighborhood-based emergency preparedness and response organization. CERPP's mission is "to encourage, assist, and coordinate the development of neighbor-to-neighbor emergency self-help activities and their interface with professional public safety services."

CERPP was established as a California nonprofit public benefit corporation in 1998. The Towns of Woodside and Portola Valley have representatives on CERPP's Board of Directors and, over the years, both towns have provided financial support to the organization. CERPP serves the entire area that encompasses the Woodside Fire Protection District. The fire district has been divided into twenty-five CERPP Divisions, which represent distinct neighborhoods. A citizen volunteer Division Leader provides support and direction to Block Captains in each Division. CERPP is supported by a variety of committees, all staffed by citizen volunteers. These include the Division Leader, Communications, Logistics, and Operations Committees. CERPP also sponsors a Disaster Animal Rescue Team (DART). CERPP provided training for the general public and for its volunteers on subjects such as first aid, disaster communications, and CPR. It coordinates with the two towns and the fire district on annual emergency exercises. CERPP is an important component of the Town's emergency response capability.

Reference Map NH5, CERPP Divisions, for the CERPP division boundaries in the Town of Woodside.

## FLOOD YEARS

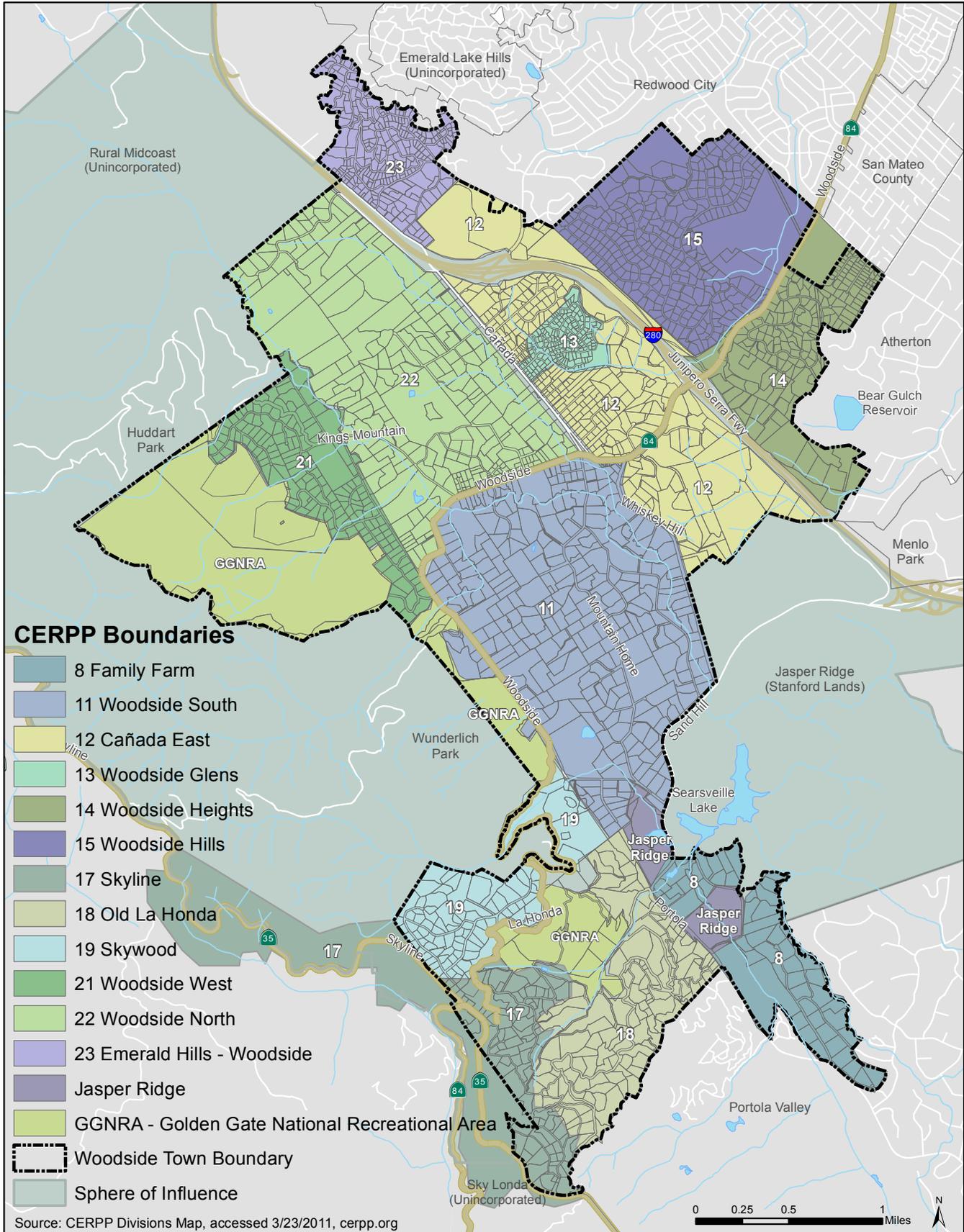
"Flood years" are estimates of peak stream flow events. A 100-year flood, for example, is calculated to be the level of water expected to be equaled or exceeded every 100 years on average (i.e., a 100-year flood stage that, statistically has a 1% probability of occurring in any given year; while a 10-year flood stage statistically has a 10% probability of occurring in any given year). The term "100-year flood" is misleading. It is not the flood that will occur once every 100 years. Rather, it is the flood elevation that has a 1 percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. The 100-year flood is usually developed from a statistical distribution that is based on historical floods. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) shows the areas of Town located within various flood hazard areas.

## FIRE STATIONS

The entire Town of Woodside is in the Woodside Fire Protection District (WFPD), with its headquarters (Station 7) located at 3111 Woodside Road near the Town Center. Fire protection is also provided:

- WFPD Station No. 8 in Portola Valley at 135 Portola Road;
- WFPD Station No. 19 in the unincorporated area of Emerald Lake Hills at 4901 Jefferson Avenue;
- Cal Fire (a State agency) Station No. 58 in Skylonda at 17290 Skyline Boulevard;
- Cal Fire Station No. 18 in the Emerald Lake Hills area at 300 Edmonds Road; and,
- By mutual aid agreements with Redwood City, the Menlo Park Fire Protection District, and Stanford University.

Map NH5: Citizens Emergency Response Preparedness Program (CERPP)



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## GOAL NH2

### Emergency preparedness.

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The goal for emergency preparedness is to prepare for adequate emergency response and recovery, ensure the continued functioning of facilities critical to society, and facilitate post-disaster relief and recovery operations.

#### **POLICY NH2.1 – PRESERVE THE FUNCTIONING OF CRITICAL FACILITIES**

The primary response of the Town is to ensure that critical facilities will continue to function in the event of fire, natural, or other disasters.

##### 1. Critical Facilities

Critical facilities, such as major transportation links, communications and utility lines, and emergency shelter facilities, should be located, designed and operated in a manner which maximizes their ability to remain functional after a disaster.

##### 2. Hazard Sensitive Utilities

New roads, bridges and utility lines (either public or private) that cross active or potentially active fault traces should be designed and constructed with recognition of the hazard of fault movement. Such designs shall consider the possibility of up to about a 20 foot right-lateral displacement on the active (1906) trace of the San Andreas Fault Zone.

##### 3. Utility Line Examination

All existing utility lines that cross active or potentially active fault traces shall be examined to determine their ability to survive fault movement. Utility companies should institute orderly programs of installing shut-off devices on these lines, starting with the lines that cross the active (1906) trace and those which serve the most people. Adequate emergency water supplies should be established and maintained in areas served by water lines which cross active fault traces.

##### 4. Roadways

Roads shall be improved as feasible to have adequate width and clearance to function in times of emergencies.

##### 5. Evacuation Routes

Interstate 280, Woodside Road, and the arterial roads shown in the Circulation Element of this General Plan are established as “evacuation routes” for use in the event of emergency. Evacuation routes under Town jurisdiction shall be maintained in usable conditions at all times. Emergency evacuation routes should not be impeded by structures, low overhead signs, or trees that would block the passage of vehicles.

#### Strategies:

##### **a. Review and update regulations**

Review, update, and coordinate the Town’s land use, site development, and land division regulations as needed to require that the location and design of critical facilities be reviewed with respect to continued functioning in the event of fire, natural, or other disasters.

##### **b. Improve infrastructure**

Work with local utility providers to identify infrastructure at risk during a natural disaster, and prioritize improvement plans.

##### **c. Coordinate with Woodside Fire Protection District**

Coordinate with the Woodside Fire Protection District on access requirements and specifications.

## POLICY NH2.2 – DEVELOP EMERGENCY PREPAREDNESS PLANS

The Town shall develop emergency preparedness plans to protect lives and property.

### Strategies:

#### **a. Hazard Mitigation**

Institute a program to identify existing hazards and the associated risks. Develop, and prioritize, risk reduction measures, to include; improvement of substandard water supplies, provision of emergency escape routes in high areas of high risk, placement of legible road signs, and other appropriate measures.

#### **b. Emergency Operations Center**

Upgrade the Town's Emergency Operations Center (EOC) and train Town staff as needed. Review emergency equipment needs, such as a defibrillator at Town Hall, and prioritize acquisition.

#### **c. Livestock Evacuation Plan**

Provide public education on the livestock evacuation plan developed by the CERPP.

#### **d. Cooperation with Other Agencies**

The Town of Woodside will continue its cooperation with County, State, and federal agencies in emergency preparedness measures, and in mutual assistance programs

## POLICY NH2.3 – FACILITATE POST DISASTER RELIEF AND RECOVERY OPERATIONS

The Town shall facilitate post-disaster relief and recovery operations.

### Strategies:

#### **a. Update Emergency Preparedness Plan**

The Town of Woodside will include measures in its Emergency preparedness Plan which address the Post Disaster needs of the Town's residents and businesses for inspections, debris removal, streamlined permit issuance for rebuilding, and other essential services.

## POLICY NH2.4 – SUPPORT EMERGENCY PREPAREDNESS EDUCATION

The Town shall institute or participate in community education and information programs which increase the community's ability to cope with local emergencies, as well as preparing for possible major disasters.

Residents of the Woodside Planning Area should keep on hand food, water, and medical supplies sufficient for several days in the event of disaster.

### Strategies:

#### **a. Emergency Preparedness Outreach**

Institute, or participate in and publicize relevant community education and information programs which increase public awareness of procedures for coping with local emergencies and major disasters.

#### **b. Assess Community Education Plan**

Periodically assess the community education and information needs and update the program as needed to prepare the community for emergencies.

#### **c. Utilize Website**

Utilize the Town website as a forum for disseminating information on emergency preparedness.

#### **d. Interjurisdictional Cooperation and Coordination**

Cooperate and coordinate with other jurisdictions, agencies or organizations in providing community education and information programs.

#### **e. Emergency Preparedness Programs**

Promote emergency preparedness programs, such as the Citizen's Emergency Response and Preparedness Program (CERPP). Encourage residents to participate in their neighborhood CERPP divisions.

