



# Appendix F

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# Fire Protection Plan



**FIRE PROTECTION PLAN  
FOR  
OTAY RANCH, VILLAGE 8 WEST**

**PREPARED FOR:**

**City of Chula Vista  
Development Services Department  
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**&**

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## **1.0 INTRODUCTION**

Village 8 West has historically been referred to as Otay Land Company's Parcel B. The site includes portions of Otay Ranch Villages 4, 7, and 8. The Village encompasses approximately 320 acres and is located in the southwest quadrant of Otay Ranch. The Village is proposed to be composed of mixed-use dwelling units, multi-family dwelling units, single-family residential, retail/commercial, schools, parks, a community purpose facility, and open space (Figure 1-Tentative Map, Map Pocket). The project is proposed to be built in several phases. Fire protection is provided to the project area by the City of Chula Vista Fire Department. The project will incorporate several of the Firewise Community Design features. Details of the Firewise Community design features can be found on the Firewise website at [Firewise.org/USA](http://Firewise.org/USA).

### **1.1 Purpose of the Fire Protection Plan**

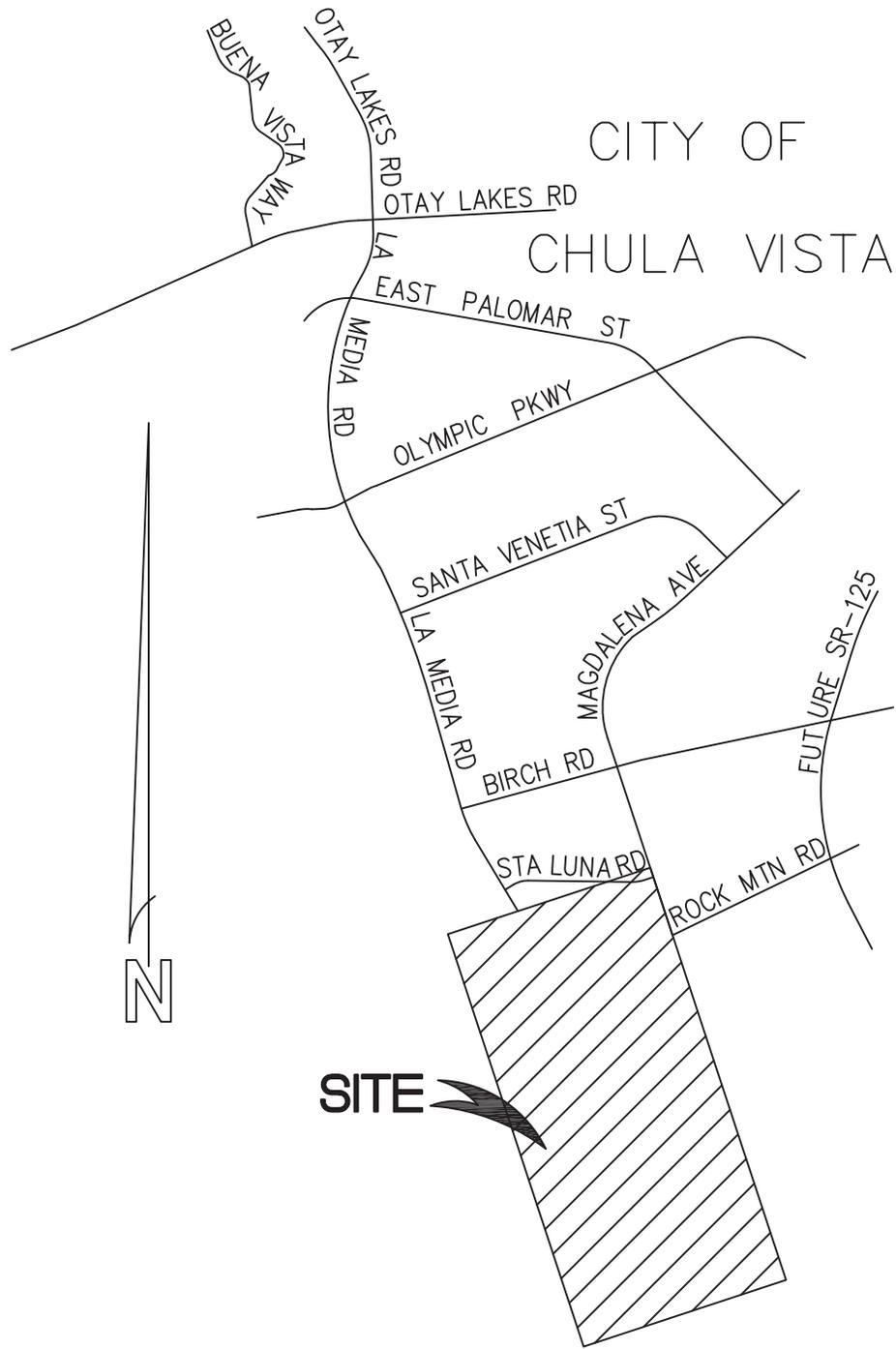
The purpose of this Fire Protection Plan (FPP) is to address fire safety and compliance with applicable codes, ordinances, and regulations for Village 8 West. The primary focus of this plan is the southern perimeter of the site, which contains native vegetation that is being placed in open space. Additionally, this vegetation is contiguous with native vegetation offsite to the south. Based on this proximity to the Urban Wildland Interface (UWI) and fire modeling that reflects up to a 1.4 mile distance for spot fires, all residential structures within Village 8 West shall require fire resistive construction. The plan references current codes and regulations at the time it is being written. However, the codes and regulations in place (i.e. adopted) at the time of development shall apply.

### **1.2 Project Location**

The Village 8 West project, hereinafter referred to as the proposed project, is located in the City of Chula Vista. The project is located at the southern terminus of La Media Road (Figure 2). Portions of Village 7 lie to the north, the balance of Village 8 to the east, the Otay River Valley and a portion of the MSCP Preserve to the south, and Village 4 and an additional portion of MSCP Preserve to the west. The project is located in an area of existing development, proposed development, agriculture, and undeveloped lands (Figure 3).

### **1.3 Land Uses**

The development plan for Village 8 West calls for the implementation of 1429 mixed-use (MU) and multi-family (MF) dwelling units, 621 single family dwelling units, 300,000 square feet of retail/commercial uses, two potential school sites, four park sites, a community-purpose facility (CPF) site, and open space and utility and roadway easements/rights of way (Figure 1). The estimated 24-hour population of Village 8 West is 5735 persons.



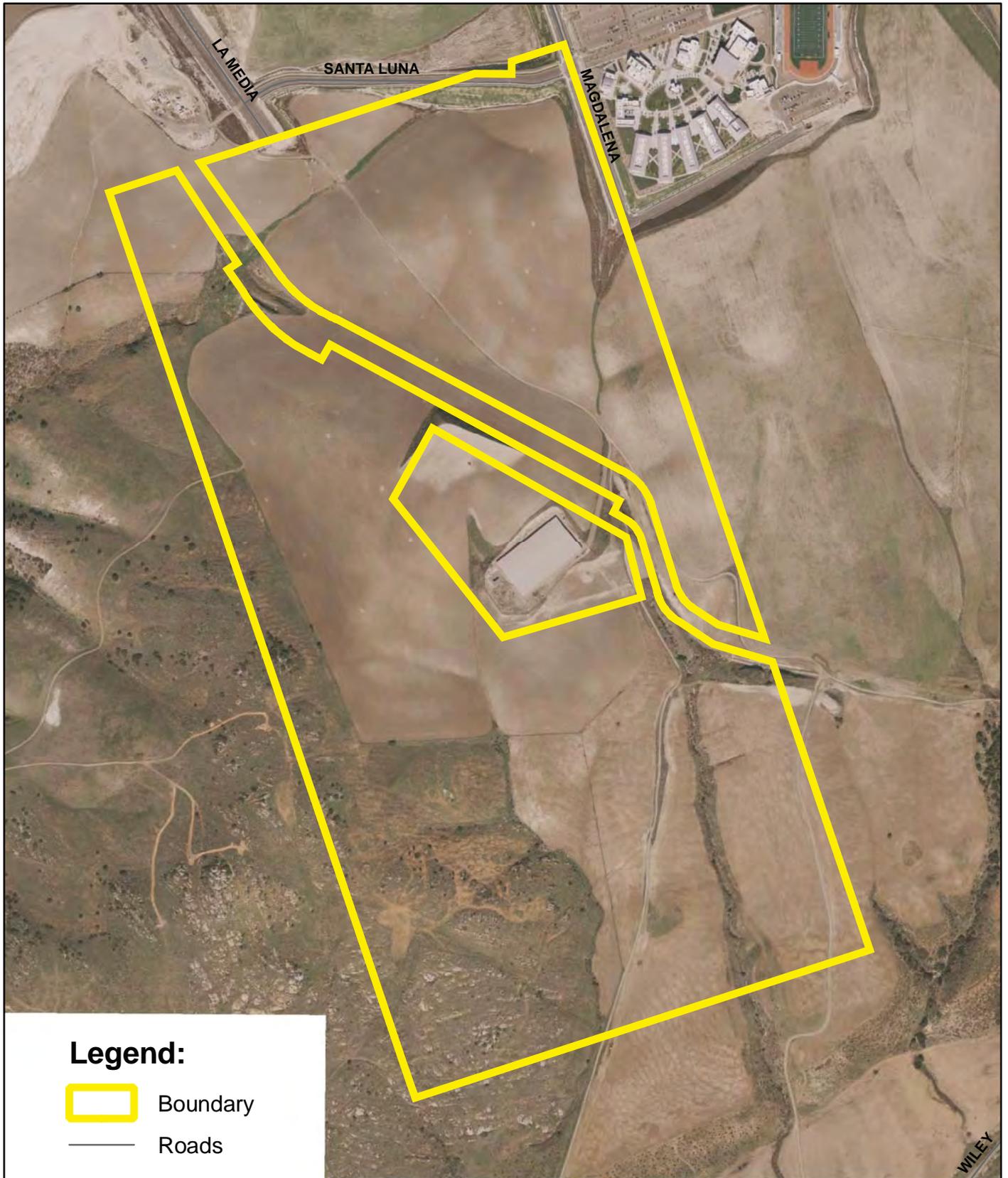
**RC**

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**Vicinity Map**

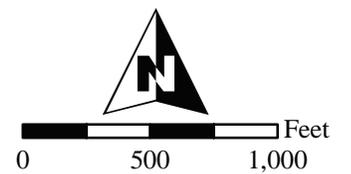
(not to scale)

**Figure 2**



Source: TerraServer 1/1/2008

**Figure 3**  
**Aerial Photograph**



## 1.4 Open Space

There is an open space lot proposed in the southwestern corner of the project (Figure 1). The open space is required as a result of that portion of the project, approximately 23 acres, being located within an area designated as 100 % Conservation Area – Habitat Preserve (Preserve) within the City’s Multiple Species Conservation Program (MSCP) Subarea Plan. No development or fuel modification will occur within this lot other than an underground storm drain and an access road.

## 2.0 ACCESS

Future road access to Village 8 West will be provided by existing La Media Road from the north, future Main Street from the east and west, future Otay Valley Road from the southeast, and existing Magdalena Road in the northeast corner of the project site.

La Media Road, the primary access road, is proposed both as a couplet road in the northern portions of the project and a divided road in the southern (Figure 1). Both the one-way couplet portions and the divided road portion provide two eleven-foot wide travel lanes in each direction. Main Street is also proposed as a couplet road built with the same travel lane dimensions.

Proposed Streets A and B, which provide circulation for both the higher density residential development and the retail/commercial development, both propose a travel lane width of eleven feet in each direction. The typical Parkway Residential is proposed to have two ten-foot wide travel lanes in each direction.

The project shall comply with the City of Chula Vista Construction Site Policy for Compliance with Fire Safety Provisions. The project phasing and road construction shall be such that required numbers of access points are provided in conformance with the City of Chula Vista Subdivision Manual Section 3-403.2 (7) (2002). Specific requirements under this Section are:

- For a street ending in a cul-de-sac, the maximum is 30 single-family lots
- Single-family development shall not exceed 120 lots unless two points of access are provided
- Single-family development shall not exceed 200 lots unless three points of access are provided
- “Points of access” means streets with no driveway access consisting of two or more lanes. Emergency access-only connections are not considered points of access.

These requirements do not apply to condominium or multi-family development.

Firefighter foot access points along the Urban-Wildland Interface (UWI) for this project will be available at the following locations, which are at approximately 1000 foot intervals.

These access points are depicted on Figure 10. If fences are proposed in these areas then gates will be provided.

### 3.0 ADDRESSES

All buildings are required to be separately addressed. Unit numbers shall be placed at appropriate locations and be plainly visible and legible from the street fronting the property from either direction of approach. The numbers shall contrast with their background and shall meet the following minimum size standards: 4" high with a 3/8" stroke for residential buildings, 6" high with a 1/2" stroke for commercial and multi-residential buildings and 12" high with a 1" stroke for industrial buildings. Address numbers shall be automatically illuminated after dark by low voltage lighting. Additional numbers shall be required where deemed necessary by the fire code official, such as rear access doors, building corners and entrances to commercial centers. The fire code official may establish different minimum sizes for numbers for various categories of projects. In addition, geographical directories will be required at entrances to multiple building developments on a parcel. The City of Chula Vista has prepared Premise Identification Guidelines for reference.

The following table identifies the requirements for commercial development.

| Distance from Building to Face of Curb | Minimum Number Height | Minimum Stroke |
|----------------------------------------|-----------------------|----------------|
| 0-50 feet                              | 6 inches              | 1 inch         |
| 51-150 feet                            | 10 inches             | 1.5 inches     |
| ➤ 150 feet                             | 16 inches             | 2 inches       |

### 4.0 WATER SUPPLY

The Otay Water District (OWD) will provide potable water services. The City of Chula Vista utilizes the California Fire Code for determining required fire flows and durations for new development. The fire code utilizes a number of factors to determine the required fire flow for a building. These factors include building footprint, building construction materials, and whether or not the building has sprinklers. Since this level of detail is not known at the planning stage, this report uses the fire flow requirements utilized by the Otay Water District in master planning storage, transmission, and distribution facilities throughout their District. The fire flow requirement will be a minimum of 1,500 gpm and may be increased for individual sites based on the factors described above.

Hydrants shall be placed along road ways and fire access paths a maximum of 300 feet apart in multi-family and commercial areas. Hydrant spacing shall be placed along roadways a maximum of 500 feet in single-family residential areas (Ordinance 3093 §1, 2007). Spacing maybe increased to a minimum of 1000 feet where no structures are proposed adjacent to the road. The Chula Vista Fire Department shall review proposed fire hydrant layout throughout this project and provide an overall approval.

#### **4.1 Fire Sprinklers**

Fire sprinklers will be installed in conformance with Section 903 of the California Fire Code. All single family residences and duplexes will be required to have fire sprinklers in conformance with the California Residential Code (CRC).

#### **4.2 Fire Monitoring Systems**

Fire monitoring systems shall be installed in conformance with Section 907 of the California Fire Code (2007).

### **5.0 FIRE SERVICES**

The City of Chula Vista is in the process of updating their Fire Master Plan. If the Master Plan determines that a fire station is required in Village 8 West then the project may be required to designate an area for a future fire station.

The nearest fire station is Station 7, located at 1640 Santa Venetia Road, within Village 2. Station 7 has 24 assigned staff with eight on duty at any given time, including the Battalion Chief. The station is equipped with one engine and one ladder truck. Another station is proposed within the East Urban Center. The anticipated date for completion of this station is unknown at this time (See Eastern Urban Center Trigger Analysis).

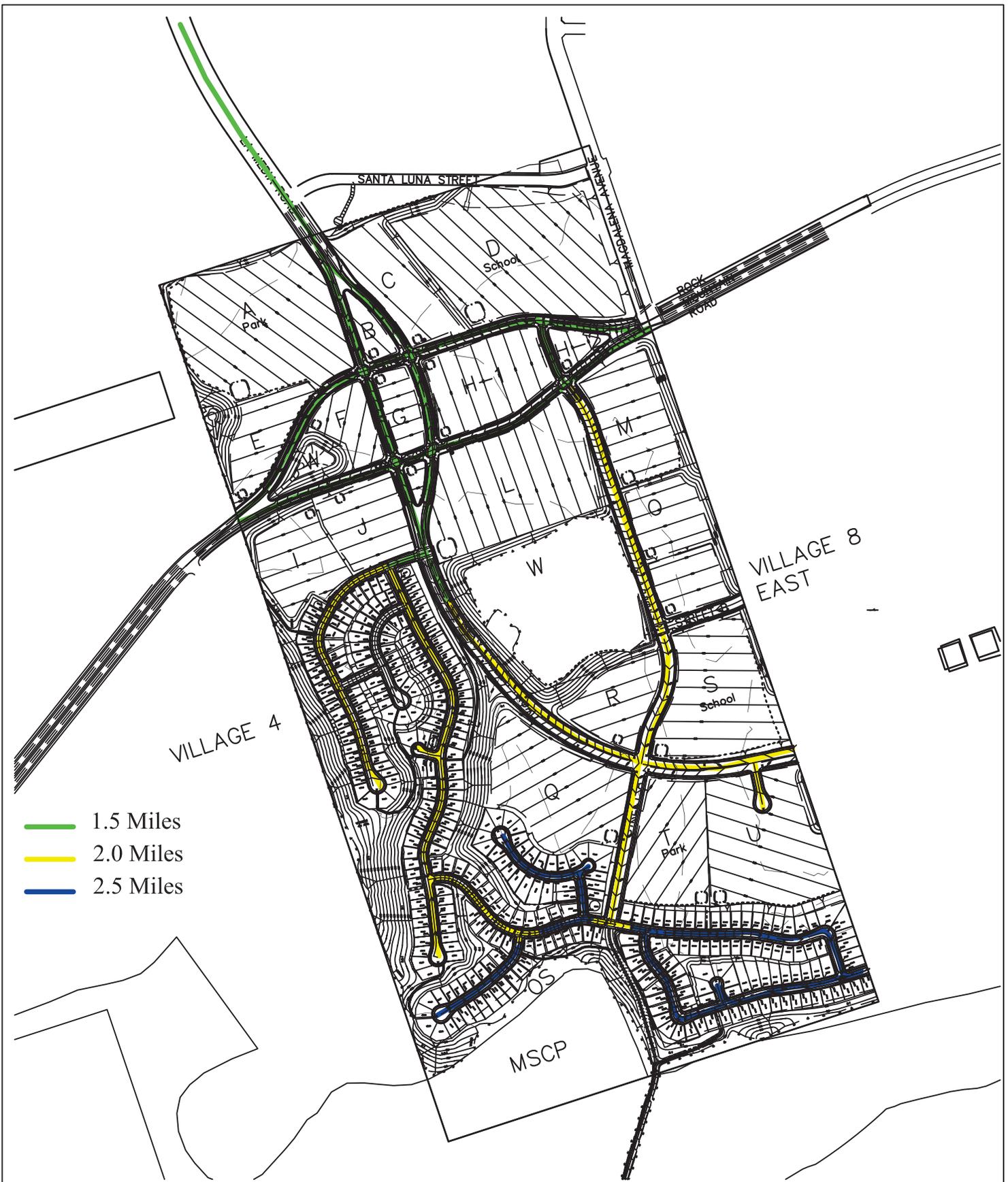
The City of Chula Vista Growth Management Ordinance states properly equipped and staffed fire and medical units shall respond to calls throughout the city within seven minutes in 80 percent of the cases (City Municipal Code Section 19.09.040). The City of Chula Vista provided an analysis (Figure 4) showing that all areas of Village 8 West are located within 2.5 miles of Fire Station 7. The City determined that 2.5 miles can be traveled with the required response time within the Growth Management Ordinance.

### **6.0 SETTING AND FIRE HISTORY**

The California Department of Forestry and Fire Protection has developed recommended maps of “Very High Fire Hazard Zones” for local responsibility areas. The City of Chula Vista has adopted the map (Ordinance 3113§ 1, 2008). The project is not located in an area identified as a “Very High Fire Hazard Zone,” as recommended by the California Department of Forestry and Fire Protection (Figure 5). The following sections discuss the surrounding land use, topography, vegetation, climate, and fire history.

#### **6.1 Surrounding Land Use and Topography**

The project site is primarily surrounded by undeveloped lands, primarily dry farming and an area of development along the northeastern boundary (Figure 3). Rock Mountain is west of the project site near the southern border and Otay River is to the south (Figure 6). The



- 1.5 Miles
- 2.0 Miles
- 2.5 Miles

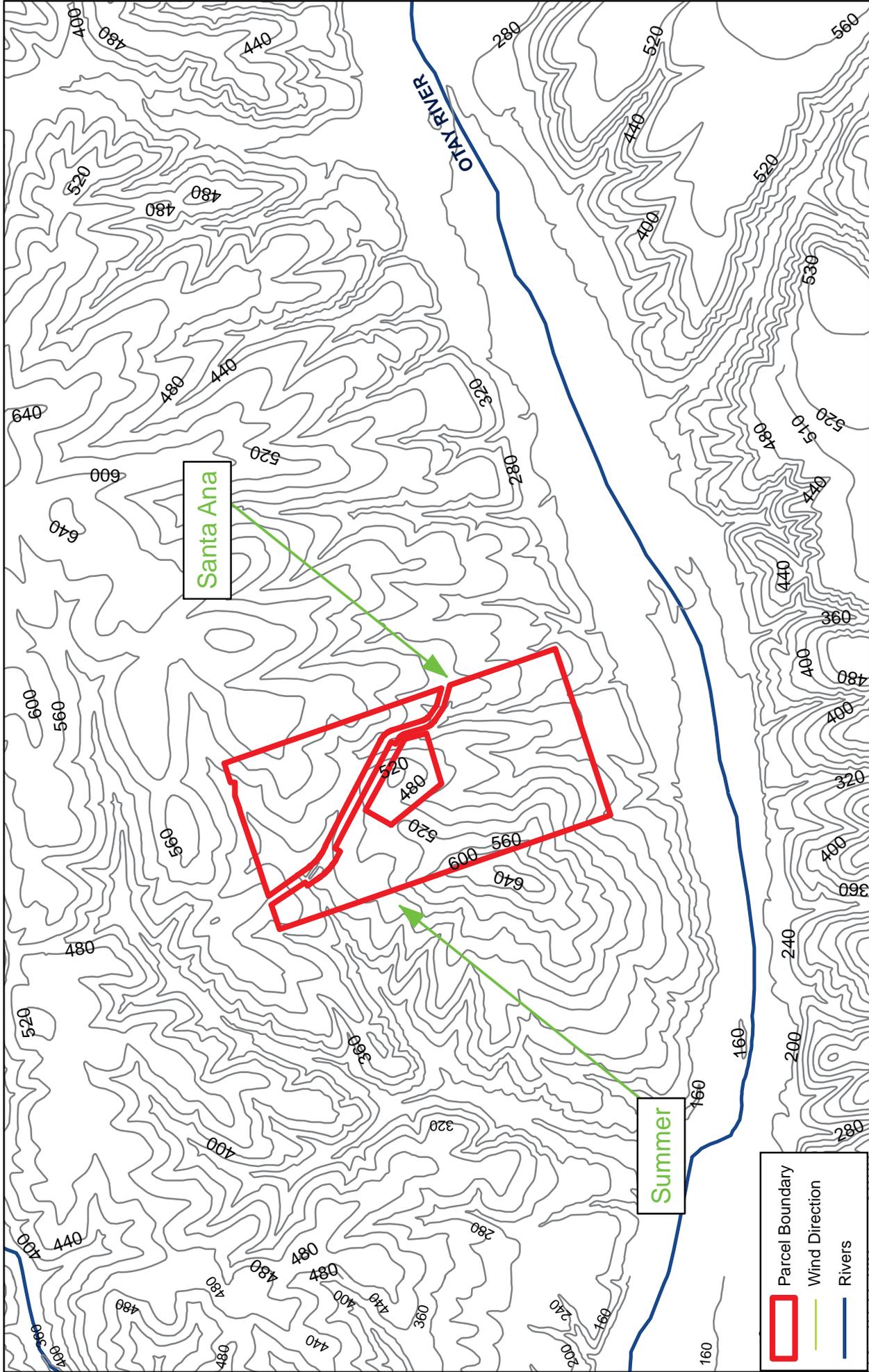
**RC**

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Coverage Area

Figure 4





**Figure 6**  
**Contour Map**

proposed development area spans the project site, with a limited amount of open space in the southwestern corner. The site is gently sloping to the south, with steeper slopes in the southwestern portion of the project. The elevations onsite range from approximately 300 feet above mean sea level (AMSL) to 600 feet AMSL.

## 6.2 Vegetation

Plant communities on and off-site were mapped by URS and included as Figure 7. Two plant communities within the on-site open space and adjacent to the project site were considered for fuel load: Diegan coastal sage scrub and non-native grassland. The coastal sage scrub would also represent the maritime succulent scrub, a limited amount of which occurs adjacent to the project site on the west. The fuel loading for non-native grassland is considered a conservative representative of the agriculture and disturbed habitats adjacent to the site. Developed land also occurs adjacent to the project site. The proposed open space is composed primarily of coastal sage scrub and some non-native grassland within the southwestern portion of the project site and offsite to the south. Photograph 1 illustrates the coastal sage scrub habitat proposed to be preserved within the on-site open space. Photograph 2 represents the dry farmed areas on and adjacent to the site.



Photograph 1. Coastal Sage Scrub within Proposed Open Space in the southwest corner



Path: G:\GIS\projects\15772763\027\support\Oney Land\_Council\Report\_Figures\October\_2010\Village\_8\_WeatVeg.mxd, 10/14/10, paul\_monro

SOURCES: SANGIS (Parcels, Roads 2010)  
 URS (field survey, 2006)  
 AERIALS EXPRESS, (Jan 2009)

**VEGETATION**  
**VILLAGE 8 WEST**  
**OTAY LAND CO**



250 0 250 500 Feet  
 SCALE: 1" = 500' (1:6,000)  
 SCALE CORRECT WHEN PRINTED AT 11X17

|               |                          |          |
|---------------|--------------------------|----------|
| CREATED BY PM | DATE: 10-14-10           | FIG. NO: |
| PM: PM        | PROJ. NO: 27654036.05000 | 3        |

| LEGEND |                                       |
|--------|---------------------------------------|
|        | Not a Part                            |
|        | Chula Vista MSCP 100% Preserve Area   |
|        | Vegetation                            |
| ag     | 18300 - Extensive Agriculture         |
| css    | 32500 - Coastal Sage Scrub            |
| d-css  | 32500 - Disturbed Coastal Sage Scrub  |
| fwm    | 52400 - Freshwater Marsh              |
| mss    | 32400 - Maritime Succulent Scrub      |
| mfs    | 63110 - Mulefat Scrub                 |
| nng    | 42000 - Non Native Grasland           |
| d-nng  | 42200 - Disturbed Non Native Grasland |
| dev    | 12000 - Developed                     |
| dist   | 11300 - Disturbed Habitat             |

Figure 7



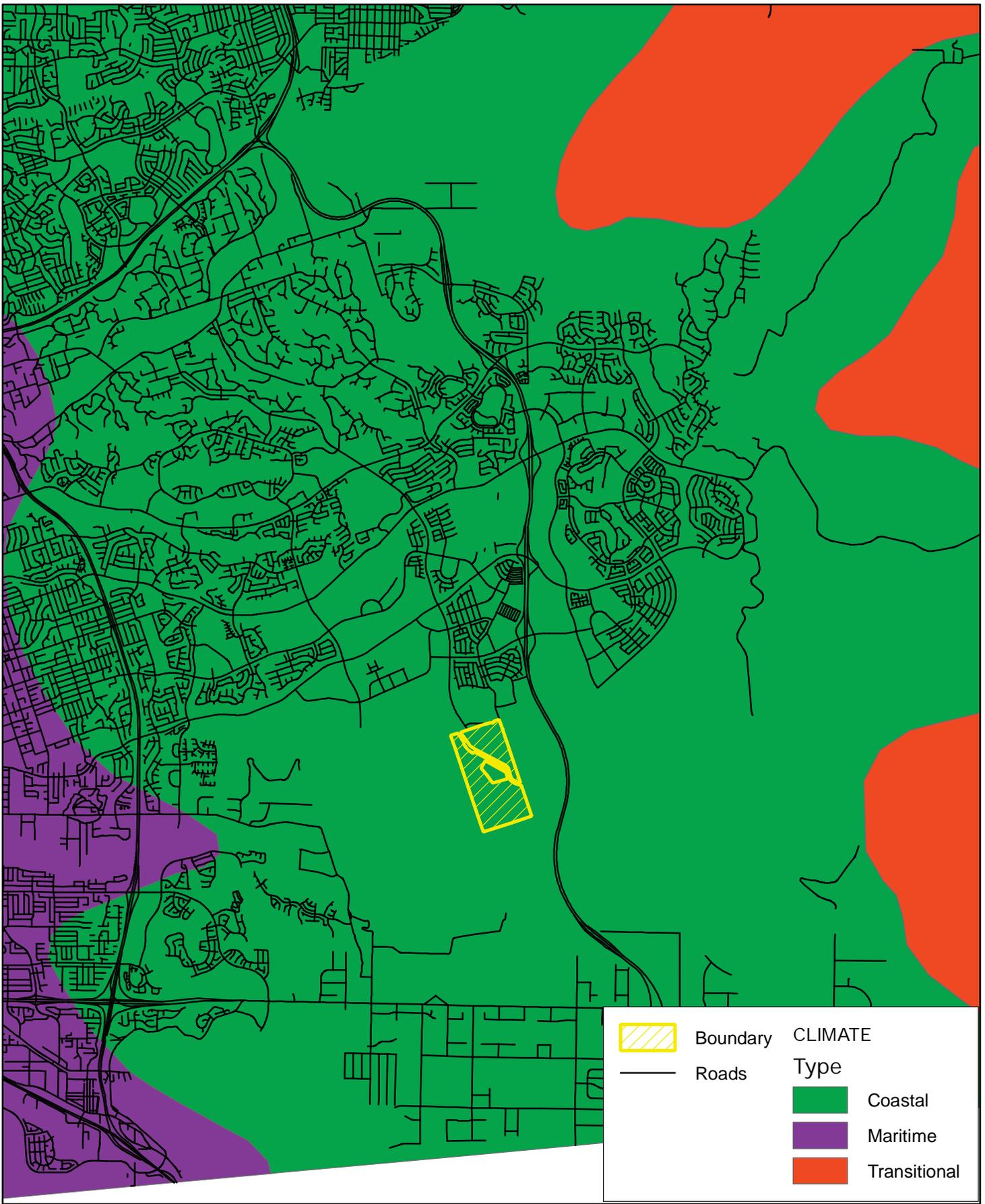
Photograph 2. Dry Farmed Land along the eastern boundary

### **6.3 Climate**

As defined by the National Weather Service, San Diego has four climate zones: coastal, inland, mountain, and desert climate. These climate zones are determined by several factors: proximity to the ocean, terrain, elevation, and latitude. Using the Koppen system, the metropolitan areas of Southern California have a Mediterranean climate, characterized by mild, sometimes wet winters and warm, very dry summers. The Mediterranean climate includes all coastal areas, valleys and foothills. Annual precipitation amounts increase gradually from the coast to the mountain crests, then drop dramatically into the deserts. Most precipitation comes from winter storms between November and March. The site is located within the coastal climate zone (Figure 8). Average rainfall is 11 inches per year (Western Regional Climate Center).

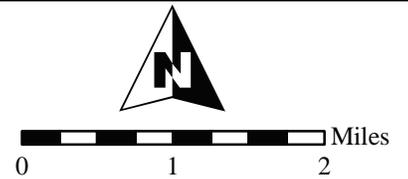
### **6.4 Fire History**

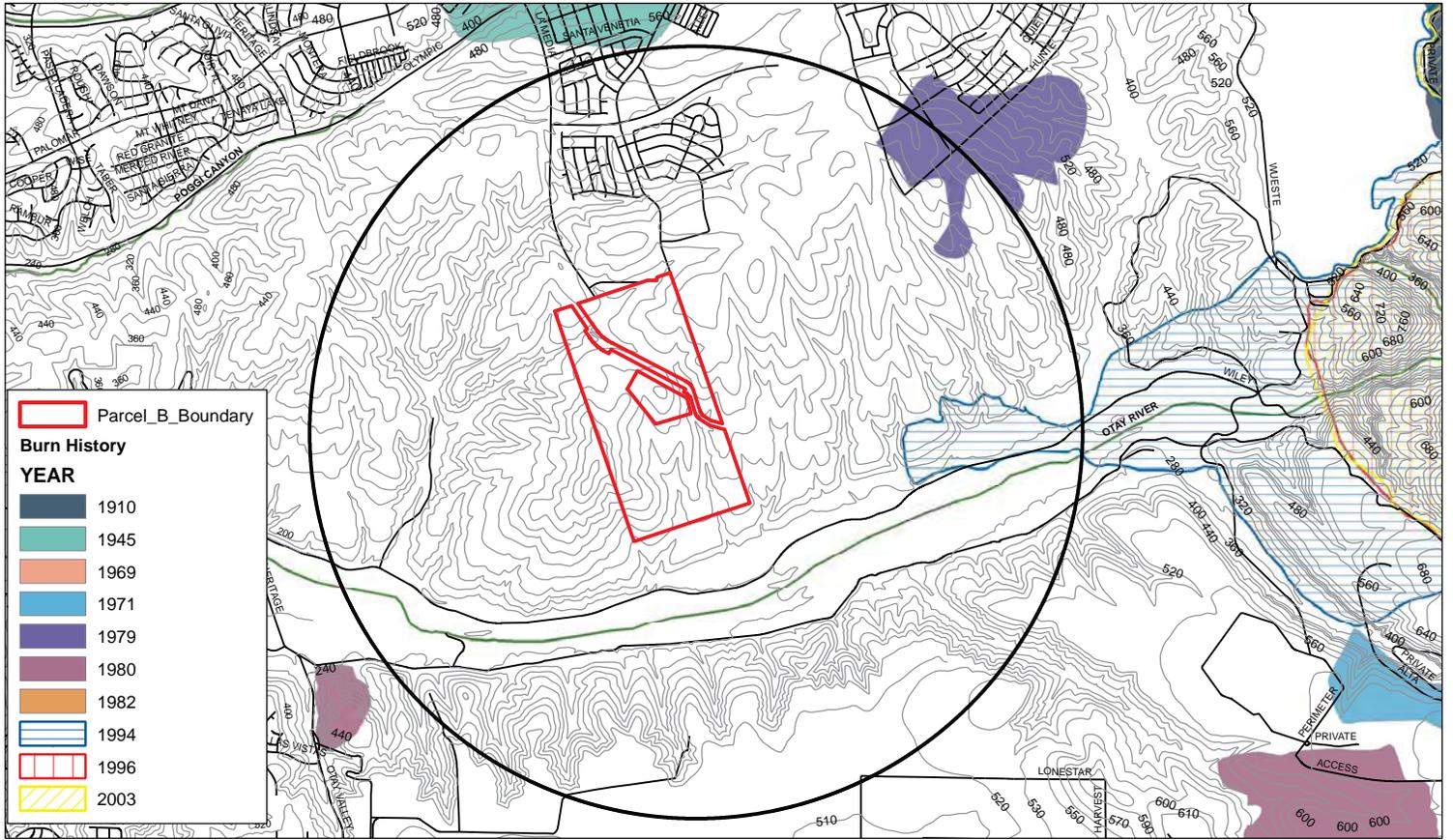
The fire history of the site and surrounding area (approximately 2.5 mile diameter) was reviewed (Figure 9). The source of the fire history information is the California Department of Forestry's Fire and Resource Assessment Data from 2007. No fires have been documented on the site. The Mine/Otay fire of 2003, which started the day after the Cedar fire, burned to within approximately 2 miles of the eastern property line. Two fires have burned within the 2.5 miles surrounding area between 1910 and 2003 (Table 1). For those fires within the figure itself with known dates of origin the majority of them occurred during the summer and fall months of June through November.



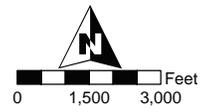
Source: SanGIS

**Figure 8**  
**Climate Map**





**Figure 9**  
**Burn History**



| <b>Name</b> | <b>Year</b> | <b>Month</b> | <b>Day</b> | <b>Acres</b> | <b>Cause</b>  | <b>Agency</b> |
|-------------|-------------|--------------|------------|--------------|---------------|---------------|
| None        | 1979        | Unknown      | Unknown    | 211          | Miscellaneous | USF           |
| Otay # 4    | 1994        | 10           | 10         | 2983         | Campfire      | CDF           |

## **7.0 RISK ASSESSMENT – WILDLAND FIRE**

The area does not have a significant history of burning from wildland fires as discussed in Section 6.4 – Fire History. The site is proposed to be developed in two phases. The remaining on-site vegetation threat would primarily be a small amount of coastal sage scrub that is proposed to be preserved within open space. Coastal sage scrub occurs offsite to the west and to the south of the project site. Dry farmed lands or grasslands primarily occur to the east of the project. Fire modeling indicates a spotting distance of 1.4 miles which encompasses the entire project.

### **7.1 Fuel Modeling**

Fire modeling was performed using Behave Plus 4.0 for two types of weather conditions: a Santa Ana conditions (Fall), including gusts, and a normal weather conditions (Summer). RAWS (Remote Automated Weather Station) data was not available. Weather data are from the Western Regional Climate Center (WRCC) Brown’s Field, which is approximately two miles to the south. Weather data are included in Appendix A.

The results of the modeling are summarized here and included in Appendix B. The adjacent topography is varied. The offsite threat is primarily from dry farmed land on the north and east. A conservative slope of 20% and GR4 were used to model this habitat. Southern California fuel model SCAL 18 (sage/buckwheat) was used to represent the coastal sage scrub to the west of the site and within the open space on the south of the property on and off-site. The coastal sage scrub onsite is associated with a slope of 16%. A conservative slope of 20% was used to model this habitat. Table 2, identifies the weather inputs for each of the conditions: Santa Ana, peak and summer.

| <b>Period</b> | <b>Temperature (Fahrenheit)</b> | <b>Relative Humidity</b> | <b>Sustained Wind Speed (mph)</b> |
|---------------|---------------------------------|--------------------------|-----------------------------------|
| Peak (Gusts)  | 90°                             | 0-4%                     | 32                                |
| Santa Ana     | 90°                             | 0-4%                     | 25                                |
| Summer        | 90°                             | 10-14%                   | 5                                 |

Modeling was performed for coastal sage scrub and agricultural lands found within and adjacent to the proposed development. Table 3 identifies the habitats and fuel models used to represent the habitat.

| <b>Habitat</b>         | <b>Fuel Model</b> | <b>Description*</b>                                                                                                                                                                                                                              |
|------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dry Climate Grasslands | GR4               | The primary carrier of fire in this model is continuous, dry-climate grasses. The typical depth is two feet. This is a conservative model of for non-native grassland to the east. This model allows that the grasslands may not always be mown. |
| Coastal Sage Scrub     | SCAL18            | This fuel model has been developed for a common southern California habitat, coastal sage scrub.                                                                                                                                                 |

\* The complete model parameters are included as Appendix C.

The full results of the modeling are included in Appendix B and summarized below for each weather period.

### **7.1.1 Santa Ana Condition**

A Santa Ana weather condition is potentially the worst weather for fire. Santa Ana's typically occur from September to May. The fall Santa Ana can create extremely dangerous fire conditions because they are associated with high temperatures, high winds coming from the north/northeast and low humidity. They also occur after long periods of no rain, when the vegetation is in a drought-stress condition. The soft shrubs that compose habitats such as coastal sage scrub are semi-drought deciduous and have typically lost the majority of their foliage by the end of summer.

#### Fire Behavior

Santa Ana winds result in a wind-driven fire. These winds typically come from the northeast. Santa Ana winds are Foehn winds, which are warm, dry winds that result from air spilling over high elevations and moving downhill. These are gravity winds that typically follow the ground. When gravity winds hit an obstacle they can either split around the obstacle and continue, or follow the object to the top, launch over the top, and result in an area behind the obstacle with normal wind conditions.

The site is generally the southern facing slope of an east/west trending valley containing the Otay River. A Santa Ana wind would drive the fire to the west along the river valley with topography leading it up the slopes to the project site. There is a large area of undeveloped land within the river valley that would result in a potential fire being able to move north toward the site.

#### Fire Modeling

Modeling was performed using the Santa Ana weather conditions identified in Table 2 and the fuel model identified in Table 3.

| <b>Table 4. Results for a Santa Ana Fire</b> |                           |                               |
|----------------------------------------------|---------------------------|-------------------------------|
|                                              | <b>Coastal Sage Scrub</b> | <b>Grassland/ Agriculture</b> |
| <b>Flame Length</b>                          | 28'                       | 19'                           |
| <b>Rate of Spread<sup>1</sup></b>            | 105 ch/h                  | 358 ch/h                      |
| <b>Spotting Distance<sup>2</sup></b>         | 1.1 mi                    | 0.8 mi                        |
| <b>Probability of Ignition<sup>3</sup></b>   | 89%                       | 89%                           |

### 7.1.2 Peak Conditions

Peak conditions are the extreme conditions during a Santa Ana event. The peak winds represent the gusts that occur during a Santa Ana.

#### Fire Behavior

The fire behavior would be essentially the same as during a Santa Ana; however, the gusts could significantly increase the rate of spread and the distance that fire brands travel during the time that they are occurring.

#### Fire Modeling

Modeling was performed using the peak weather conditions identified in Table 2 and the fuel model identified in Table 3.

| <b>Table 5. Results for a Peak Conditions</b> |                           |                               |
|-----------------------------------------------|---------------------------|-------------------------------|
|                                               | <b>Coastal Sage Scrub</b> | <b>Grassland/ Agriculture</b> |
| <b>Flame Length</b>                           | 31'                       | 22'                           |
| <b>Rate of Spread</b>                         | 131 ch/h                  | 507 ch/h                      |
| <b>Spotting Distance</b>                      | 1.4 mi                    | 1.1                           |
| <b>Probability of Ignition</b>                | 89%                       | 89%                           |

<sup>1</sup> Surface rate of spread is the "speed" the fire travels through the surface fuels. Surface fuels include the litter, grass, brush and other dead and live vegetation within about 6 feet of the ground. (BehavePlus 4.0)

<sup>2</sup> Spotting distance from a wind-driven surface fire is the maximum distance that one can expect potential spot fires based on firebrands from a spreading wind-driven surface fire. The model is applicable only if the fire is truly wind-driven through surface fuels that are not sheltered from the wind by overstory. (BehavePlus 4.0)

<sup>3</sup> Probability of ignition from a firebrand is an indication of the chance that a firebrand will cause an ignition. The number of firebrands, their size, and the fuel on which they land is generally unknown. Therefore, there is no specific interpretation of the probability of ignition of a fire.(BehavePlus 4.0)

### 7.1.3 Normal Weather Condition

Normal weather conditions consist of an onshore flow from the southwest. This condition has a lower temperature and higher humidity than a Santa Ana condition.

#### Fire Behavior

A fire under normal conditions is typically a fuel-driven fire; however, wind will also contribute to the rate of spread. A fire that started offsite to the south would also be influenced by topography, with the project being at higher elevations than the undeveloped land offsite.

#### Fuel Modeling

Modeling was performed using the summer weather conditions identified in Table 2 and the fuel model identified in Table 3.

| <b>Table 6. Results for Summer Conditions</b> |                           |                               |
|-----------------------------------------------|---------------------------|-------------------------------|
|                                               | <b>Coastal Sage Scrub</b> | <b>Grassland/ Agriculture</b> |
| <b>Flame Length</b>                           | 15'                       | 7'                            |
| <b>Rate of Spread</b>                         | 27 ch/h                   | 44 ch/h                       |
| <b>Spotting Distance</b>                      | 0.2 mi                    | 0.1 mi                        |
| <b>Probability of Ignition</b>                | 89%                       | 89%                           |

Based on the modeling, the greatest anticipated flame length is from the coastal sage scrub burning during a Peak Santa Ana fire. The resulting flame length is 31 feet. The remaining flame lengths are less than 31 feet.

The model is an estimate of the flame lengths that can be anticipated. Actual fire behavior can be more or less intensive.

## 8.0 FIRE RESISTIVE CONSTRUCTION

As a result of the project being located within the UWI, and all of the residential structures being located within the potential spotting distance of 1.4 miles, all residential structures shall implement fire resistive construction. Construction methods shall follow Chapter 7A of the California Building Code, "Materials and Construction Methods for Exterior Wildfire Exposure"

([http://www.fire.ca.gov/fire\\_prevention/downloads/ICC\\_2009\\_Ch7A\\_2007\\_rev\\_1Jan09\\_Supplement.pdf](http://www.fire.ca.gov/fire_prevention/downloads/ICC_2009_Ch7A_2007_rev_1Jan09_Supplement.pdf)) or more stringent building code requirements if adopted by the City of Chula Vista. No dwelling unit shall be constructed within the Brush Management Zone. If the Brush Management Zone extends into any private lot, a "Structure Restriction Easement" will be placed on that portion of the lot to the satisfaction of the Fire Marshal.

## **9.0 FUEL MANAGEMENT AND FIRE PROTECTION PLANNING AREAS**

As this project is a unique combination of risks and mixed use, Village 8 West has been divided into three Fire Protection Planning Areas (FPPA) to differentiate the proposed fuel management procedures. The majority of the project consists of graded, relatively flat developed areas with hardscape or ornamental landscaping. These areas present more of an urban fire risk than an Urban Wildland Interface (UWI) risk. The area adjacent to the Multiple Species Conservation Program (MSCP) Subarea Conservation Area – Habitat Preserve (Preserve) to the south is the primary fuel threat. This area will be described as FPPA A.

FPPA B is composed of the remainder of the perimeter slopes adjacent to the residential areas that have steep manufactured slopes of 2:1 and an elevation change of 10 feet or greater. FPPA B is not adjacent to the MSCP.

FPPA C is composed of the remainder of the interior slopes that have steep manufactured slopes of 2:1 and an elevation change of 10 feet or greater.

The purpose of the fuel management zone (FMZ) is to provide the necessary defensible space for fire suppression and to reduce the radiant heat and convective heat that would result from a fire. Overall onsite fuel management shall be funded through the Community Facilities District (CFD) and/or Landscape Maintenance District and administered by the City of Chula Vista. This will ensure long-term maintenance of these areas. Private landowners are prohibited from conducting any fuel/brush management activities outside of their private property. No non-fire resistive construction is permitted by the homeowners, or developer, or their agents, within the Fuel Management Zones without written authorization from the Chula Vista Fire Department. No brush management shall occur within the MSCP Preserve.

### **9.1 Fire Protection Planning Area A (FPPA A)**

The project will provide a minimum of 150 feet of fuel management adjacent to the Preserve, as required by the City of Chula Vista Final MSCP Subarea Plan, Section 7.4.7.1, Brush Management in the Otay Ranch PMA (2003). Property adjacent to the Multiple Species Conservation Program (MSCP) Subarea Conservation Area – Habitat Preserve (Preserve) will have 150 feet of fuel management divided into three 50 foot wide zones. Zone 1 is adjacent to the structures and 50 feet in width. Zone 1 may contain some area in the backyards of areas V and P. No structures (as defined in this document) shall be built within Zone 1. A structure restriction easement shall be placed on the portion of the lots that encroach into Zone 1.

Where Zone 1 extends into the privately owned Homeowner's lots, Zone 1 will extend outside of the lot for a minimum of 50 feet. This will allow for the Zone 1 maintenance standards to be applied directly outside of the Homeowner's lot. In addition, Zone 2 will extend from a distance of 50 feet to 100 feet outside of the Homeowner's Lot. Zone 3 is adjacent to the MSCP (Figure 10). Trees, shrubs and ground covers within FPPA A shall

comply with the County of San Diego Plant List for a Defensible Space (2008) outlined in Appendix D. In addition, no plants shall be allowed from Appendix E which includes:

- City of Chula Vista Final MSCP Subarea Plan (2002), Appendix N, List of Invasive Species
- City of Chula Vista Final MSCP Subarea Plan (2002), Appendix K, List of Undesirable Plants included with the “San Diego County Fire Chief’s Association Fuel Modification Zone Plant List (2008)”

### **9.1.1 Zones**

#### **Zone 1**

Zone 1 is the area closest to the structure and is a minimum of 50 feet in width. For the purposes of fuel management, the term “structure” is defined as: “any building greater than 144 square feet in size or less than 30 feet from the building.”

- Decks, sheds, gazebos, freestanding open-sided shade covers, and similar accessory structures less than 144 square feet and 30 feet or more from a dwelling, and fences more than 5 feet from a dwelling, are not considered structures for the establishment of a fuel modification zone.
- Zone 1 will be composed of landscaped low-fuel native plants and/or hardscape. Plants must be low growing (less than 18 inches), including groundcover and vines. Exceptions to this maximum height limitation are:
  - Trees are allowed provided:
    - No tree canopies are lower than 13’ 6” over roadways.
    - No trees or limbs are permitted within 10 feet of a structure.
    - Trees must be spaced 20’ apart between mature canopies, 40’ if on slopes equal to or greater than 2:1. These distances are measured on a horizontal plane and not along the slope.
    - No flammable manufactured items are permitted.
    - Trees must be limbed up to three times the height of the understory for mature trees, or ten feet, whichever is greater.
    - No trees within 45 feet of the top or toe of slopes that may occur within Zone 1 or 2.
- Fuel management within this zone shall consist of landscape plantings that are maintained to not create fire hazards near structures.

## **Zone 2**

Zone 2 extends 50 feet beyond Zone 1, and requires that vegetation be limited to two to three feet high. The critical brush management activity in Zone 2 is the clearing of dead underbrush. Portions of Zone 2 may be cleared as a result of grading for the project and as a result some of the following requirements will not apply.

- Thinning shall be performed such that any native vegetation retained is composed of small patches with spacing in-between. Thinning shall prioritize the removal of the plants on the Undesirable Plant List (Appendix F).
- The only vegetation allowed is that found in the Approved Plant List (Appendix E). Native shrubs allowed to remain can be pruned and thinned to reduce fuel load and be aesthetically pleasing. Shrubs clusters will not exceed 400 sq. feet.
- Shrub cluster density shall be reduced to a distance of no less than the width of the largest shrub's mature spread between each cluster or 20 feet, whichever is greater.
- Vegetation within Zone 2 shall be limited in maximum height to 36". Randomly placed CVFD-approved succulent type plant materials may exceed the height limitation provided they are spaced in groups of no larger than three plants and a minimum of five feet away from described "clear access routes."
- Brush management shall be accomplished through hand clearing.
- No hedges are allowed.
- Trees are allowed as stated under Zone 1, with restrictions stated herein.
- All plants listed on the City of Chula Vista Final MSCP Subarea Plan (2002), Appendix N, Lists of Invasive Species shall be removed and City of Chula Vista Final MSCP Subarea Plan (2002), Appendix K, List of Undesirable Plants included with the "San Diego County Fire Chief's Association Fuel Modification Zone Plant List (2008)"
- Zone 2 may have temporary irrigation installed as required to ensure adequate vegetative cover for slope stability and removed after plant establishment.
- Zone 2 areas adjacent to the Preserve shall have non-emergency brush management undertaken, to the maximum extent practicable, outside the bird breeding season (April 1 through June 31) in areas where breeding and/or nesting may occur.

## **Zone 3**

Zone 3 is adjacent to the MSCP. This area will be similar to Zone two except that non-fire resistive vegetation coverage will be reduced to less than 70%. Plants will be limited to 36" in height. Randomly placed CVFD-approved succulent type plant materials may exceed the height limitation provided they are spaced in groups of no larger than three plants and a minimum of five feet away from described "clear access routes."

Shrub cluster density shall be reduced to a distance of no less than the width of the largest shrub's mature spread or 20 feet, whichever is greater.

## **9.2 Fire Protection Planning Area B (FPPA B)**

This area is shown on Figure 10. FPPA B will consist of two zones. Zone 1 will be adjacent to the development and will be 50 feet in width. Zone two will be adjacent to the native vegetation and will be a minimum of 50 feet in width. Zones 1 and 2 have the same requirements as to Zones 1 and 2 of FPPA area A, however FPPA area B will include the plant palette as outlined in Appendix E. FPPA B will follow the installation, spacing, and maintenance requirements for FPPA A Zones 1 and 2 unless otherwise specified by the City of Chula Vista Fire Marshal.

## **9.3 Fire Protection Planning Area C**

Fire Protection Planning Area C is composed of the steep manufactured interior slopes that have slopes of 2:1 or greater and an elevation change of 10 feet or greater. This zone varies in width. Types and spacing of plants, trees and shrubs are outlined on the Landscape Master Plan. These areas may include privately maintained slopes or slopes maintained by the CFD.

## **9.4 Offsite Fuel Management**

An offsite easement for fuel management will be required for 100 feet adjacent to Neighborhood P (Lots 48-50) and Neighborhood V (lots 18-35). The offsite easement will be located within FPPA area B. Requirements are discussed in Section 9.2. This easement may be vacated or reduced at the discretion of the Chula Vista Fire Department and Development Services Department, City of Chula Vista, based on subsequent development.

- Fuel management within this area shall consist of landscape plantings that are maintained to not create fire hazards near structures. All of the plants in this zone must be listed in the “San Diego County Fire Chief’s Association Fuel Modification Zone Plant List (2008) (Appendix D).
- Other plant species may be used upon the approval of the Fire Marshal and Assistant City Manager/Development Services.

## **9.5 Maintenance For All Fire Protection Planning Areas**

All zones shall be maintained in the accordance with Sections 9.1, 9.2 and 9.3.

### **Zone 1**

- Conduct annual, or more frequent if necessary, maintenance to reduce fuel volumes, remove dead and detached material, and maintain in healthy succulent condition. Some private landowners have fuel management Zone 1 occurring on their property and are responsible for maintenance of this area within their lot lines. The covenants, conditions and restrictions (CC&Rs) for the parcels with Zone 1 on their property shall reflect free and full access for City of Chula Vista Fire Department and Public Works Department to monitor and enforce brush

abatement as well as the requirements for the Limited Building Zone. Gates shall not prevent the access of these personnel to conduct these inspections. Fuel management within the individual boundaries of these lots is the responsibility of the lot owner. During initial implementation and before these lots are sold the lots will be maintained by the developer.

- Maintain irrigation in a working condition (if applicable);
- Mature trees greater than 18' shall be limbed up to a minimum of 6' above the ground or 3 times the height of the groundcover, whichever is greater;
- No tree limbs within 10' of chimneys or dead limbs overhanging structures;
- Trees adjacent to or overhanging roadways, driveways, or other emergency access paths shall be maintained with a minimum height clearance of 13' 6".

### **Zone 2 and 3**

- Conduct annual, or more frequent if necessary, maintenance to reduce fuel volumes, remove dead and detached material, and maintain in healthy succulent condition;
- Conduct annual removal of plants on the invasive plant list that may have become established.

Vegetation maintenance shall be the responsibility of the Landscape Maintenance District, its successors or assignees, or owner. Overall onsite fuel management shall be funded through the Community Facilities District (CFD) and/Landscape Maintenance District and administered by the City of Chula Vista. This will ensure long-term maintenance of these areas.

## **9.6 Fuel Management During Construction/Phase Implementation**

During phase implementation fuel management shall be implemented. Lots that are vacant will not be required to have brush management until construction begins, except those portions within 100 feet of any structure under construction or existing, then normal fuel management zones apply.

Fuel management zones required for a particular parcel shall be installed and maintained prior to flammable material being brought onto the parcel. This applies even if fuel management has to occur on adjacent parcels.

## **9.7 Fuel Management for Parks and Community Open Space**

This section applies only to parks and community open space within the development. This section specifically does not apply to the MSCP preserve area in the southeastern portion of the project site. Parks and community open space shall be maintained in a fire safe manner. Types and spacing of plants, trees and shrubs will comply with the same criteria as Fire Protection Planning Area B.

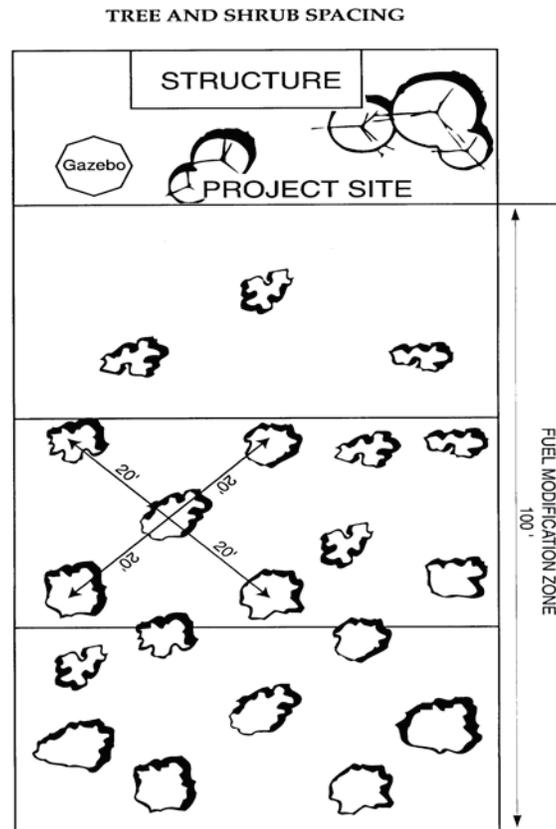
## 9.8 Emergency Brush Management

In the event that the City Fire Marshal determines an emergency situation exists, minimal additional brush management may be undertaken under the direction of the Fire Marshal. In such an emergency situation, the Fire Marshal will adhere to the Memorandum of Understanding between the Wildlife Agencies, California Department of Forestry, the San Diego County Fire Chief's Association, and the Fire District's Association of San Diego County dated February 26, 1997

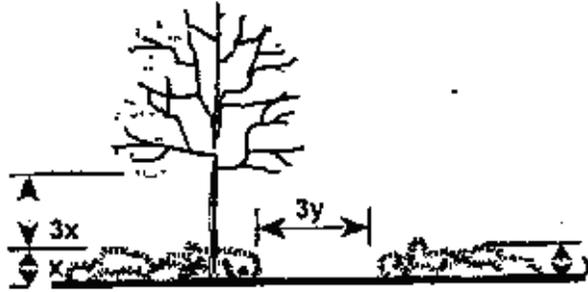
## 10.0 GUIDELINES FOR PLANTING IN FUEL MODIFICATION ZONES

Planting in fuel modification areas shall be in accordance with the following guidelines:

1. Limit planting in large unbroken masses, especially trees and large shrubs, while simultaneously trying to achieve the desired screening. Groups should be two (2) or three (3) maximum, with mature foliage of any group separated horizontally by at least twenty (20) feet. Specific planting details are outlined in Section 9.1.



2. Avoid massing of shrubs at bases of trees or larger shrubs; adhere to the plant spacing illustrated below:



3. Avoid massing of vegetation adjacent to structures, especially under eaves, overhangs, decks, etc.
4. Limit the use of plants that have the following characteristics:
  - Dry or deciduous foliage during part of the year.
  - Deciduous or shaggy bark.
  - Dry or dead undergrowth.
5. Avoid topping trees as this causes excessive branching, which can increase fire danger.

## 11.0 REFERENCES

- BehavePlus 4.0. Behave Plus 4.0 Fire Modeling Software. [www.firemodels.org](http://www.firemodels.org)
- California Fire Code 2007. California Code of Regulations, Title 24, Part 9. International Code Council.
- Cal-IPC. 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, CA. Available: [www.cal-ipc.org](http://www.cal-ipc.org).
- Chula Vista. Construction Site Policy for Compliance with Fire Safety Provisions. [http://www.chulavistaca.gov/City\\_Services/Public\\_Safety/Fire\\_Department/Safety/prevention.asp](http://www.chulavistaca.gov/City_Services/Public_Safety/Fire_Department/Safety/prevention.asp)
- Chula Vista. Premise Identification Guidelines. [http://www.chulavistaca.gov/City\\_Services/Public\\_Safety/Fire\\_Department/Safety/prevention.asp](http://www.chulavistaca.gov/City_Services/Public_Safety/Fire_Department/Safety/prevention.asp)
- Chula Vista. Structure Setback Detail. [http://www.chulavistaca.gov/City\\_Services/Public\\_Safety/Fire\\_Department/Safety/prevention.asp](http://www.chulavistaca.gov/City_Services/Public_Safety/Fire_Department/Safety/prevention.asp)
- Chula Vista 2002. Subdivision Manual. Development Services Department. Chula Vista, CA. Revised 7/1/2010.
- Chula Vista 2002. Ordinance 2879§1. Adoption of the International Code Council Urban – Wildland Interface Code.
- Chula Vista 2003. City of Chula Vista Final MSCP Subarea Plan.
- Chula Vista 2007. Ordinance 3093. Ordinance of the City of Chula Vista amending Chapter 15.36 of the Chula Vista Municipal Code Adopting the California Fire Code. December 2007.
- Chula Vista 2008. Ordinance 3113§ 1, Adoption of map titled “Very High Severity Hazard Zones (VHFHSZ)-Local Responsibility Areas (LRA).
- County of San Diego. Undesirable Plants. <http://www.sdcounty.ca.gov/dplu/docs/UndesirablePlants.pdf>
- International Urban Wildland Interface Code 2000. International Code Council.
- San Diego Fire Chief’s Association 1997. Fuel Modification Zone Plant List.
- Western Regional Climate Center. <http://www.wrcc.dri.edu/>

**APPENDIX A**  
**WEATHER CONDITIONS**

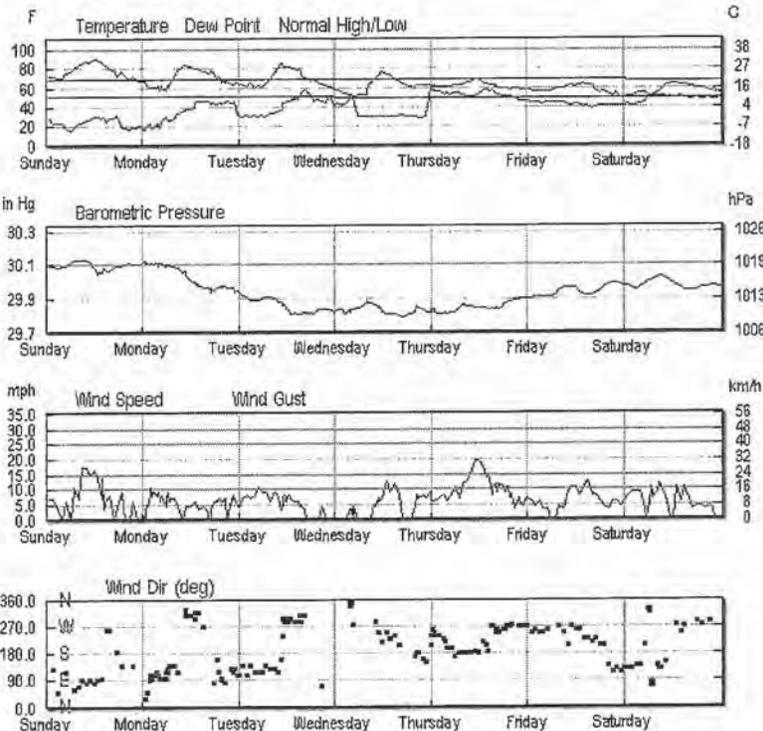


### History for San Diego Brown, CA

Week of October 26, 2003 through November 1, 2003

#### Weekly Summary

|                               | Max:     | Avg:     | Min:     | Sum:    |
|-------------------------------|----------|----------|----------|---------|
| <b>Temperature:</b>           |          |          |          |         |
| Max Temperature               | 91 °F    | 77 °F    | 64 °F    |         |
| Mean Temperature              | 80 °F    | 66 °F    | 57 °F    |         |
| Min Temperature               | 64 °F    | 55 °F    | 50 °F    |         |
| <b>Degree Days:</b>           |          |          |          |         |
| Heating Degree Days (base 65) | 8        | 3        | 0        | 20      |
| Cooling Degree Days (base 65) | 15       | 4        | 0        | 29      |
| Growing Degree Days (base 50) | 30       | 16       | 7        | 115     |
| <b>Dew Point:</b>             |          |          |          |         |
| Dew Point                     | 59 °F    | 41 °F    | 16 °F    |         |
| <b>Precipitation:</b>         |          |          |          |         |
| Precipitation                 | 0.06 in  | 0.01 in  | 0.00 in  | 0.06 in |
| Snowdepth                     | -        | -        | -        | -       |
| <b>Wind:</b>                  |          |          |          |         |
| Wind                          | 20 mph   | 5 mph    | 0 mph    |         |
| Gust Wind                     | 25 mph   | 22 mph   | 20 mph   |         |
| <b>Sea Level Pressure:</b>    |          |          |          |         |
| Sea Level Pressure            | 30.13 in | 29.95 in | 29.79 in |         |



#### Daily Observations

| 2003    | Temp. (°F)   | Dew Point (°F) | Humidity (%) | Sea Level Pressure (in) | Visibility (mi) | Wind (mph) | Gust Speed (mph) | Precip (in) | Events |
|---------|--------------|----------------|--------------|-------------------------|-----------------|------------|------------------|-------------|--------|
| October | high avg low | high avg low   | high avg low | high avg low            | high avg low    | high avg   | high             | sum         |        |

|                 |                   |            |            |                       |            |            |                     |            |            |                                |            |            |                        |            |            |                   |            |                         |            |                    |               |
|-----------------|-------------------|------------|------------|-----------------------|------------|------------|---------------------|------------|------------|--------------------------------|------------|------------|------------------------|------------|------------|-------------------|------------|-------------------------|------------|--------------------|---------------|
| <u>26</u>       | 91                | 80         | 64         | 34                    | 25         | 16         | 24                  | 14         | 10         | 30.13                          | 30.09      | 30.05      | -                      | 8          | 2          | 17                | 7          | 25                      | 0.00       |                    |               |
| <u>27</u>       | 84                | 70         | 57         | 47                    | 30         | 17         | 52                  | 25         | 13         | 30.12                          | 30.11      | 29.94      | -                      | 3          | 1          | 10                | 3          | -                       | 0.00       |                    |               |
| <u>28</u>       | 86                | 72         | 59         | 58                    | 45         | 31         | 70                  | 38         | 18         | 29.92                          | 29.89      | 29.81      | -                      | 3          | 2          | 10                | 7          | -                       | 0.00       |                    |               |
| <u>29</u>       | 77                | 64         | 50         | 59                    | 40         | 28         | 100                 | 44         | 19         | 29.88                          | 29.82      | 29.79      | -                      | 4          | 0          | 13                | 0          | -                       | 0.00       |                    |               |
| <u>30</u>       | 70                | 64         | 57         | 58                    | 57         | 46         | 88                  | 73         | 53         | 29.90                          | 29.83      | 29.81      | -                      | 10         | 10         | 20                | 6          | 24                      | 0.00       | Rain               |               |
| <u>31</u>       | 64                | 57         | 50         | 45                    | 44         | 39         | 74                  | 57         | 41         | 29.99                          | 29.92      | 29.90      | -                      | 10         | 9          | 13                | 5          | -                       | 0.00       |                    |               |
| <b>2003</b>     | <b>Temp. (°F)</b> |            |            | <b>Dew Point (°F)</b> |            |            | <b>Humidity (%)</b> |            |            | <b>Sea Level Pressure (in)</b> |            |            | <b>Visibility (mi)</b> |            |            | <b>Wind (mph)</b> |            | <b>Gust Speed (mph)</b> |            | <b>Precip (in)</b> | <b>Events</b> |
| <b>November</b> | <b>high</b>       | <b>avg</b> | <b>low</b> | <b>high</b>           | <b>avg</b> | <b>low</b> | <b>high</b>         | <b>avg</b> | <b>low</b> | <b>high</b>                    | <b>avg</b> | <b>low</b> | <b>high</b>            | <b>avg</b> | <b>low</b> | <b>high</b>       | <b>avg</b> | <b>high</b>             | <b>sum</b> |                    |               |
| <b>1</b>        | 64                | 58         | 51         | 52                    | 47         | 42         | 100                 | 76         | 58         | 30.03                          | 29.97      | 29.95      | -                      | 9          | 2          | 12                | 7          | -                       | 0.06       | Rain               |               |



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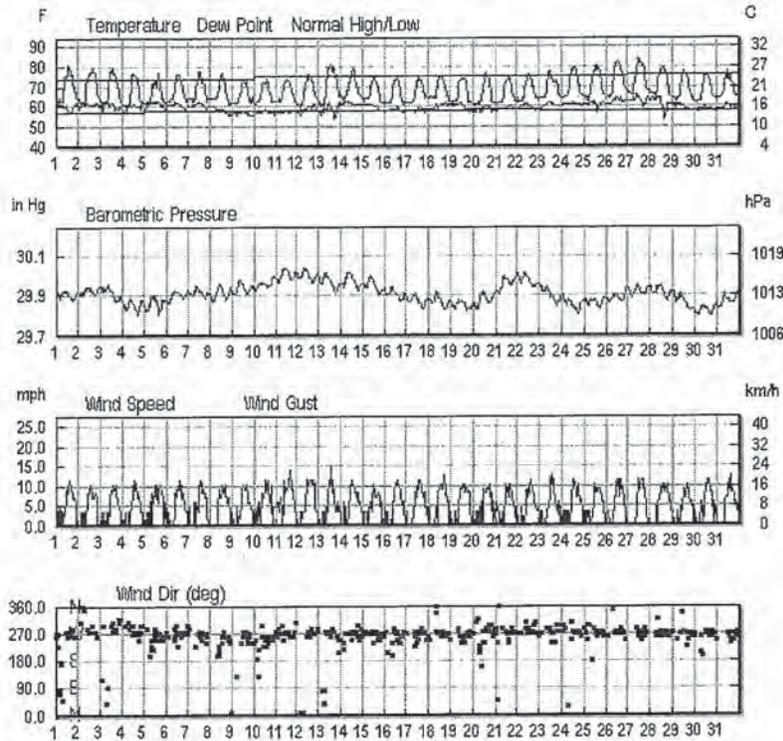


### History for San Diego Brown, CA

Month of July, 2007

#### Monthly Summary

|                               | Max:     | Avg:     | Min:     | Sum:    |
|-------------------------------|----------|----------|----------|---------|
| <b>Temperature:</b>           |          |          |          |         |
| Max Temperature               | 84 °F    | 78 °F    | 74 °F    |         |
| Mean Temperature              | 75 °F    | 70 °F    | 67 °F    |         |
| Min Temperature               | 65 °F    | 62 °F    | 59 °F    |         |
| <b>Degree Days:</b>           |          |          |          |         |
| Heating Degree Days (base 65) | 0        | 0        | 0        | 0       |
| Cooling Degree Days (base 65) | 10       | 5        | 2        | 168     |
| Growing Degree Days (base 50) | 25       | 19       | 16       | 604     |
| <b>Dew Point:</b>             |          |          |          |         |
| Dew Point                     | 66 °F    | 59 °F    | 53 °F    |         |
| <b>Precipitation:</b>         |          |          |          |         |
| Precipitation                 | 0.00 in  | 0.00 in  | 0.00 in  | 0.00 in |
| Snowdepth                     | -        | -        | -        | -       |
| <b>Wind:</b>                  |          |          |          |         |
| Wind                          | 16 mph   | 5 mph    | 0 mph    |         |
| Gust Wind                     | 21 mph   | 16 mph   | 16 mph   |         |
| <b>Sea Level Pressure:</b>    |          |          |          |         |
| Sea Level Pressure            | 30.04 in | 29.91 in | 29.80 in |         |

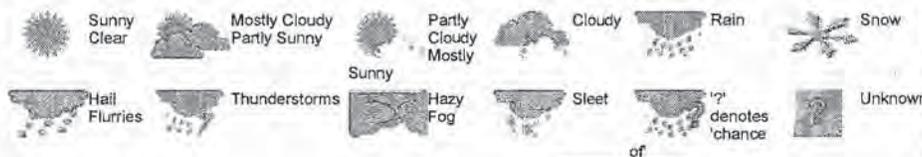


#### Monthly Calendar Overview

| « Previous Month |           | « 2006    |           | July 2007 |           | 2008 »    |                                                                  | Next Month »                                                     |                                                                  |                                                                  |                                                                  |                                                                  |                                                                  |  |  |
|------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|--|--|
| Sunday           | Monday    | Tuesday   | Wednesday | Thursday  | Friday    | Saturday  |                                                                  |                                                                  |                                                                  |                                                                  |                                                                  |                                                                  |                                                                  |  |  |
| <u>1</u>         | <u>2</u>  | <u>3</u>  | <u>4</u>  | <u>5</u>  | <u>6</u>  | <u>7</u>  | Actual: 82   62<br>Precip: 0.00<br>Average: 74   57<br>Precip: - | Actual: 79   62<br>Precip: 0.00<br>Average: 74   57<br>Precip: - | Actual: 80   59<br>Precip: 0.00<br>Average: 74   57<br>Precip: - | Actual: 78   59<br>Precip: 0.00<br>Average: 74   57<br>Precip: - | Actual: 77   61<br>Precip: 0.00<br>Average: 74   58<br>Precip: - | Actual: 77   62<br>Precip: 0.00<br>Average: 74   58<br>Precip: - | Actual: 80   63<br>Precip: 0.00<br>Average: 74   58<br>Precip: - |  |  |
| <u>8</u>         | <u>9</u>  | <u>10</u> | <u>11</u> | <u>12</u> | <u>13</u> | <u>14</u> | Actual: 78   64<br>Precip: 0.00<br>Average: 74   58<br>Precip: - | Actual: 74   61<br>Precip: 0.00<br>Average: 74   58<br>Precip: - | Actual: 74   60<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 75   63<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 76   59<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 82   59<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 79   62<br>Precip: 0.00<br>Average: 75   58<br>Precip: - |  |  |
| <u>15</u>        | <u>16</u> | <u>17</u> | <u>18</u> | <u>19</u> | <u>20</u> | <u>21</u> | Actual: 76   63<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 76   62<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 77   61<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 76   64<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 76   61<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 78   60<br>Precip: 0.00<br>Average: 75   59<br>Precip: - | Actual: 76   61<br>Precip: 0.00<br>Average: 75   59<br>Precip: - |  |  |
| <u>22</u>        | <u>23</u> | <u>24</u> | <u>25</u> | <u>26</u> | <u>27</u> | <u>28</u> | Actual: 77   62<br>Precip: 0.00<br>Average: 75   59<br>Precip: - | Actual: 79   63<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 81   64<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 82   63<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 84   64<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 84   65<br>Precip: 0.00<br>Average: 76   58<br>Precip: - | Actual: 81   65<br>Precip: 0.00<br>Average: 76   58<br>Precip: - |  |  |
| <u>29</u>        | <u>30</u> | <u>31</u> |           |           |           |           |                                                                  |                                                                  |                                                                  | Actual: 79   62<br>Precip: 0.00<br>Average: 76   58<br>Precip: - | Actual: 77   61<br>Precip: 0.00<br>Average: 76   58<br>Precip: - | Actual: 78   63<br>Precip: 0.00<br>Average: 76   58<br>Precip: - |                                                                  |  |  |

« Previous Month « 2006 July 2007 2008 » Next Month »

Calendar Key:



|          |         |                        |
|----------|---------|------------------------|
| Actual:  | 90   58 | Data Category          |
| Precip:  | 0.00    | Condition              |
| Average: | 71   53 | High Temp.             |
| Precip:  | 0.03    | Lo Temp.               |
|          |         | Precip. (in inches)    |
|          |         | Daily Avg. Temp.       |
|          |         | Temps in °F            |
|          |         | -90 -30 0 30 60 90 120 |

Print This Calendar

Daily Observations

| July | 2007 Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Pressure (in) |       |       | Visibility (mi) |     |     | Wind (mph) |     | Gust Speed (mph) | Precip (in) | Events |
|------|-----------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-------------------------|-------|-------|-----------------|-----|-----|------------|-----|------------------|-------------|--------|
|      | high            | avg | low | high           | avg | low | high         | avg | low | high                    | avg   | low   | high            | avg | low | high       | avg | sum              |             |        |
| 1    | 82              | 72  | 62  | 63             | 61  | 57  | 100          | 73  | 45  | 29.93                   | 29.92 | 29.88 | 10              | 5   | 0   | 12         | 5   | 15               | 0.00        | Fog    |
| 2    | 79              | 71  | 62  | 63             | 60  | 59  | 100          | 77  | 54  | 29.94                   | 29.91 | 29.90 | 10              | 5   | 0   | 13         | 4   | 16               | 0.00        | Fog    |
| 3    | 80              | 70  | 59  | 63             | 61  | 57  | 100          | 77  | 54  | 29.96                   | 29.95 | 29.87 | 10              | 4   | 0   | 13         | 4   | 16               | 0.00        | Fog    |
| 4    | 78              | 69  | 59  | 61             | 58  | 57  | 100          | 78  | 56  | 29.89                   | 29.86 | 29.81 | 10              | 5   | 0   | 12         | 4   | 16               | 0.00        | Fog    |
| 5    | 77              | 69  | 61  | 63             | 59  | 59  | 100          | 80  | 60  | 29.90                   | 29.83 | 29.81 | 10              | 5   | 0   | 12         | 4   | 16               | 0.00        | Fog    |
| 6    | 77              | 70  | 62  | 63             | 60  | 59  | 93           | 77  | 60  | 29.93                   | 29.88 | 29.86 | 10              | 6   | 2   | 12         | 5   | 16               | 0.00        |        |
| 7    | 80              | 72  | 63  | 63             | 60  | 59  | 93           | 76  | 58  | 29.95                   | 29.91 | 29.89 | 10              | 7   | 2   | 13         | 5   | 16               | 0.00        |        |
| 8    | 78              | 71  | 64  | 60             | 60  | 55  | 87           | 71  | 54  | 29.96                   | 29.90 | 29.87 | 10              | 8   | 5   | 14         | 4   | 17               | 0.00        |        |
| 9    | 74              | 68  | 61  | 58             | 56  | 56  | 84           | 71  | 57  | 29.98                   | 29.94 | 29.91 | 10              | 9   | 5   | 13         | 5   | 17               | 0.00        |        |
| 10   | 74              | 67  | 60  | 59             | 57  | 56  | 90           | 74  | 57  | 30.00                   | 29.94 | 29.93 | 10              | 10  | 9   | 15         | 6   | 18               | 0.00        |        |
| 11   | 75              | 69  | 63  | 58             | 57  | 57  | 84           | 71  | 57  | 30.04                   | 29.99 | 29.97 | 10              | 10  | 9   | 15         | 7   | 21               | 0.00        |        |

|           |    |    |    |    |    |    |    |    |    |       |       |       |    |    |   |    |   |    |      |     |
|-----------|----|----|----|----|----|----|----|----|----|-------|-------|-------|----|----|---|----|---|----|------|-----|
| <u>12</u> | 76 | 68 | 59 | 61 | 57 | 55 | 90 | 75 | 60 | 30.04 | 30.00 | 29.97 | 10 | 10 | 8 | 14 | 5 | 18 | 0.00 |     |
| <u>13</u> | 82 | 71 | 59 | 62 | 57 | 54 | 96 | 71 | 45 | 30.01 | 29.97 | 29.92 | 10 | 8  | 0 | 16 | 5 | 18 | 0.00 | Fog |
| <u>14</u> | 79 | 71 | 62 | 63 | 62 | 60 | 93 | 74 | 54 | 30.01 | 29.95 | 29.93 | 10 | 9  | 6 | 13 | 5 | 15 | 0.00 |     |
| <u>15</u> | 76 | 70 | 63 | 61 | 61 | 58 | 93 | 77 | 60 | 30.00 | 29.95 | 29.90 | 10 | 8  | 4 | 13 | 5 | 18 | 0.00 |     |
| <u>16</u> | 76 | 69 | 62 | 60 | 57 | 57 | 90 | 74 | 58 | 29.94 | 29.92 | 29.87 | 10 | 8  | 4 | 14 | 5 | 18 | 0.00 |     |
| <u>17</u> | 77 | 69 | 61 | 60 | 58 | 57 | 84 | 71 | 57 | 29.91 | 29.88 | 29.83 | 10 | 9  | 5 | 14 | 5 | 17 | 0.00 |     |
| <u>18</u> | 76 | 70 | 64 | 62 | 59 | 59 | 87 | 74 | 60 | 29.92 | 29.88 | 29.83 | 10 | 9  | 6 | 14 | 5 | 17 | 0.00 |     |
| <u>19</u> | 76 | 69 | 61 | 62 | 60 | 57 | 93 | 78 | 62 | 29.88 | 29.86 | 29.82 | 10 | 7  | 2 | 13 | 5 | 17 | 0.00 |     |
| <u>20</u> | 78 | 69 | 60 | 60 | 58 | 57 | 96 | 76 | 56 | 29.92 | 29.86 | 29.83 | 10 | 6  | 2 | 12 | 4 | 17 | 0.00 |     |
| <u>21</u> | 76 | 69 | 61 | 60 | 57 | 57 | 90 | 75 | 60 | 30.01 | 29.95 | 29.91 | 10 | 8  | 4 | 13 | 5 | 17 | 0.00 |     |
| <u>22</u> | 77 | 70 | 62 | 61 | 59 | 58 | 93 | 77 | 60 | 30.01 | 29.99 | 29.94 | 10 | 8  | 5 | 13 | 4 | 16 | 0.00 |     |
| <u>23</u> | 79 | 71 | 63 | 62 | 59 | 59 | 87 | 73 | 58 | 29.94 | 29.94 | 29.85 | 10 | 9  | 6 | 14 | 5 | 17 | 0.00 |     |
| <u>24</u> | 81 | 73 | 64 | 62 | 60 | 60 | 87 | 71 | 54 | 29.90 | 29.88 | 29.81 | 10 | 9  | 8 | 14 | 5 | 16 | 0.00 |     |
| <u>25</u> | 82 | 73 | 63 | 63 | 61 | 57 | 93 | 69 | 45 | 29.89 | 29.87 | 29.83 | 10 | 9  | 7 | 13 | 5 | 15 | 0.00 |     |
| <u>26</u> | 84 | 74 | 64 | 64 | 61 | 61 | 87 | 69 | 51 | 29.94 | 29.88 | 29.86 | 10 | 9  | 7 | 15 | 5 | 17 | 0.00 |     |
| <u>27</u> | 84 | 75 | 65 | 66 | 63 | 58 | 87 | 69 | 51 | 29.95 | 29.91 | 29.89 | 10 | 9  | 6 | 14 | 5 | 17 | 0.00 |     |
| <u>28</u> | 81 | 73 | 65 | 64 | 63 | 53 | 93 | 68 | 42 | 29.95 | 29.92 | 29.87 | 10 | 6  | 1 | 13 | 5 | 16 | 0.00 |     |
| <u>29</u> | 79 | 71 | 62 | 61 | 61 | 58 | 93 | 74 | 54 | 29.92 | 29.90 | 29.82 | 10 | 8  | 4 | 14 | 4 | 18 | 0.00 |     |
| <u>30</u> | 77 | 69 | 61 | 60 | 58 | 57 | 90 | 74 | 58 | 29.85 | 29.81 | 29.80 | 10 | 9  | 6 | 14 | 5 | 18 | 0.00 |     |
| <u>31</u> | 78 | 71 | 63 | 61 | 58 | 57 | 84 | 69 | 54 | 29.91 | 29.86 | 29.83 | 10 | 9  | 6 | 15 | 4 | 18 | 0.00 |     |



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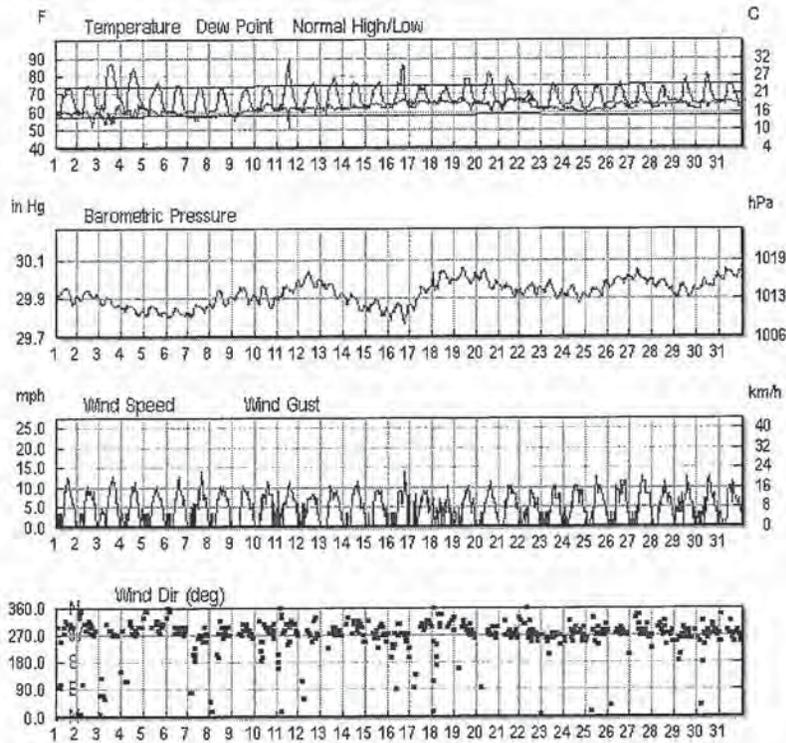
|                                                                                   |                                                         |                                 |           |                                                                                     |
|-----------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------|-----------|-------------------------------------------------------------------------------------|
|  | <b>GUARANTEED HORSEPOWER</b><br>FIND YOUR HP GAIN HERE! | 2008-2009 Honda Accord 3.5L     | +10.23 HP |  |
|                                                                                   |                                                         | 2004-2008 Ford F-150 5.4L       | +15.47 HP |                                                                                     |
|                                                                                   |                                                         | 2006-2009 Chevy Corvette Z06 7L | +27.22 HP |                                                                                     |
|                                                                                   |                                                         | 2008-2009 Pontiac G8 6.0L       | +11.88 HP |                                                                                     |
|                                                                                   |                                                         | 2006-2009 Honda Civic Si 2.0L   | + 7.01 HP |                                                                                     |

### History for San Diego Brown, CA

Month of July, 2003

#### Monthly Summary

|                               | Max:     | Avg:     | Min:     | Sum:    |
|-------------------------------|----------|----------|----------|---------|
| <b>Temperature:</b>           |          |          |          |         |
| Max Temperature               | 90 °F    | 79 °F    | 73 °F    |         |
| Mean Temperature              | 76 °F    | 69 °F    | 65 °F    |         |
| Min Temperature               | 64 °F    | 61 °F    | 55 °F    |         |
| <b>Degree Days:</b>           |          |          |          |         |
| Heating Degree Days (base 65) | 0        | 0        | 0        | 0       |
| Cooling Degree Days (base 65) | 11       | 4        | 0        | 131     |
| Growing Degree Days (base 50) | 26       | 19       | 15       | 601     |
| <b>Dew Point:</b>             |          |          |          |         |
| Dew Point                     | 67 °F    | 62 °F    | 51 °F    |         |
| <b>Precipitation:</b>         |          |          |          |         |
| Precipitation                 | 0.01 in  | 0.00 in  | 0.00 in  | 0.03 in |
| Snowdepth                     | -        | -        | -        | -       |
| <b>Wind:</b>                  |          |          |          |         |
| Wind                          | 14 mph   | 1 mph    | 0 mph    |         |
| Gust Wind                     | 17 mph   | 16 mph   | 16 mph   |         |
| <b>Sea Level Pressure:</b>    |          |          |          |         |
| Sea Level Pressure            | 30.06 in | 29.92 in | 29.77 in |         |



#### Monthly Calendar Overview

| « Previous Month                                                 |                                                                  | « 2002                                                           |                                                                  | July 2003                                                        |                                                                  |                                                                  |        |        |         |           | 2004 »   |        | Next Month » |  |
|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|--------|--------|---------|-----------|----------|--------|--------------|--|
| Sunday                                                           | Monday                                                           | Tuesday                                                          | Wednesday                                                        | Thursday                                                         | Friday                                                           | Saturday                                                         | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday     |  |
|                                                                  |                                                                  | <u>1</u>                                                         | <u>2</u>                                                         | <u>3</u>                                                         | <u>4</u>                                                         | <u>5</u>                                                         |        |        |         |           |          |        |              |  |
|                                                                  |                                                                  | Actual: 75   55<br>Precip: 0.00<br>Average: 74   57<br>Precip: - | Actual: 77   57<br>Precip: 0.00<br>Average: 74   57<br>Precip: - | Actual: 88   59<br>Precip: 0.00<br>Average: 74   57<br>Precip: - | Actual: 84   57<br>Precip: 0.00<br>Average: 74   57<br>Precip: - | Actual: 78   59<br>Precip: 0.00<br>Average: 74   58<br>Precip: - |        |        |         |           |          |        |              |  |
| <u>6</u>                                                         | <u>7</u>                                                         | <u>8</u>                                                         | <u>9</u>                                                         | <u>10</u>                                                        | <u>11</u>                                                        | <u>12</u>                                                        |        |        |         |           |          |        |              |  |
| Actual: 77   59<br>Precip: 0.00<br>Average: 74   58<br>Precip: - | Actual: 75   59<br>Precip: 0.00<br>Average: 74   58<br>Precip: - | Actual: 75   57<br>Precip: 0.00<br>Average: 74   58<br>Precip: - | Actual: 75   57<br>Precip: 0.00<br>Average: 74   58<br>Precip: - | Actual: 75   60<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 90   62<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 78   59<br>Precip: 0.00<br>Average: 75   58<br>Precip: - |        |        |         |           |          |        |              |  |
| <u>13</u>                                                        | <u>14</u>                                                        | <u>15</u>                                                        | <u>16</u>                                                        | <u>17</u>                                                        | <u>18</u>                                                        | <u>19</u>                                                        |        |        |         |           |          |        |              |  |
| Actual: 79   60<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 78   61<br>Precip: 0.01<br>Average: 75   58<br>Precip: - | Actual: 78   63<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 88   62<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 75   63<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 77   64<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 80   64<br>Precip: 0.01<br>Average: 75   58<br>Precip: - |        |        |         |           |          |        |              |  |
| <u>20</u>                                                        | <u>21</u>                                                        | <u>22</u>                                                        | <u>23</u>                                                        | <u>24</u>                                                        | <u>25</u>                                                        | <u>26</u>                                                        |        |        |         |           |          |        |              |  |
| Actual: 82   64<br>Precip: 0.00<br>Average: 75   59<br>Precip: - | Actual: 80   62<br>Precip: 0.00<br>Average: 75   59<br>Precip: - | Actual: 73   62<br>Precip: 0.00<br>Average: 75   59<br>Precip: - | Actual: 77   61<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 75   61<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 75   61<br>Precip: 0.00<br>Average: 75   58<br>Precip: - | Actual: 77   63<br>Precip: 0.00<br>Average: 75   58<br>Precip: - |        |        |         |           |          |        |              |  |
| <u>27</u>                                                        | <u>28</u>                                                        | <u>29</u>                                                        | <u>30</u>                                                        | <u>31</u>                                                        |                                                                  |                                                                  |        |        |         |           |          |        |              |  |
| Actual: 77   62<br>Precip: 0.00<br>Average: 76   58<br>Precip: - | Actual: 77   62<br>Precip: 0.01<br>Average: 76   58<br>Precip: - | Actual: 80   64<br>Precip: 0.00<br>Average: 76   58<br>Precip: - | Actual: 82   63<br>Precip: 0.00<br>Average: 76   58<br>Precip: - | Actual: 77   64<br>Precip: 0.00<br>Average: 76   58<br>Precip: - |                                                                  |                                                                  |        |        |         |           |          |        |              |  |

Calendar Key:



|          |         |                     |
|----------|---------|---------------------|
| Actual:  | 90   58 | Data Category       |
| Precip:  | 0.00    | Condition           |
| Average: | 71   53 | High Temp.          |
| Precip:  | 0.03    | Lo Temp.            |
|          |         | Precip. (in inches) |
|          |         | Daily Avg. Temp.    |
|          |         | Temps in °F         |

-80 -30 0 30 60 90 120

Print This Calendar

Daily Observations

| July | 2003 Temp. (°F) |     |     | Dew Point (°F) |     |     | Humidity (%) |     |     | Sea Level Pressure (in) |       |       | Visibility (mi) |     | Wind (mph) |      | Gust Speed (mph) | Precip (in) | Events |     |
|------|-----------------|-----|-----|----------------|-----|-----|--------------|-----|-----|-------------------------|-------|-------|-----------------|-----|------------|------|------------------|-------------|--------|-----|
|      | high            | avg | low | high           | avg | low | high         | avg | low | high                    | avg   | low   | high            | avg | low        | high | sum              |             |        |     |
| 1    | 75              | 65  | 55  | 61             | 60  | 57  | 100          | 81  | 59  | 29.96                   | 29.91 | 29.87 | -               | 6   | 0          | 13   | 1                | -           | 0.00   | Fog |
| 2    | 77              | 66  | 57  | 62             | 60  | 52  | 100          | 79  | 46  | 29.94                   | 29.91 | 29.89 | -               | 6   | 0          | 10   | 0                | -           | 0.00   | Fog |
| 3    | 88              | 74  | 59  | 64             | 57  | 54  | 90           | 62  | 32  | 29.91                   | 29.88 | 29.86 | -               | 9   | 6          | 13   | 4                | -           | 0.00   |     |
| 4    | 84              | 72  | 57  | 64             | 60  | 57  | 100          | 76  | 40  | 29.87                   | 29.85 | 29.81 | -               | 8   | 2          | 12   | 1                | -           | 0.00   |     |
| 5    | 78              | 68  | 59  | 63             | 63  | 58  | 100          | 86  | 54  | 29.86                   | 29.83 | 29.81 | -               | 5   | 0          | 10   | 2                | -           | 0.00   | Fog |
| 6    | 77              | 67  | 59  | 61             | 60  | 58  | 100          | 88  | 57  | 29.85                   | 29.82 | 29.80 | -               | 4   | 0          | 13   | 2                | -           | 0.00   | Fog |
| 7    | 75              | 66  | 59  | 58             | 57  | 56  | 93           | 80  | 55  | 29.87                   | 29.82 | 29.80 | -               | 7   | 3          | 14   | 0                | 16          | 0.00   |     |
| 8    | 75              | 66  | 57  | 59             | 57  | 57  | 96           | 81  | 57  | 29.94                   | 29.88 | 29.85 | -               | 8   | 0          | 10   | 0                | 17          | 0.00   |     |
| 9    | 75              | 65  | 57  | 62             | 57  | 55  | 100          | 86  | 66  | 29.96                   | 29.90 | 29.87 | -               | 5   | 1          | 10   | 0                | -           | 0.00   |     |
| 10   | 75              | 68  | 60  | 65             | 60  | 60  | 100          | 86  | 69  | 29.97                   | 29.91 | 29.85 | -               | 4   | 0          | 12   | 0                | -           | 0.00   | Fog |
| 11   | 90              | 76  | 62  | 63             | 62  | 51  | 100          | 83  | 26  | 30.00                   | 29.89 | 29.89 | -               | 6   | 2          | 12   | 3                | -           | 0.00   |     |

|           |    |    |    |    |    |    |     |    |    |       |       |       |   |   |   |    |   |    |      |      |
|-----------|----|----|----|----|----|----|-----|----|----|-------|-------|-------|---|---|---|----|---|----|------|------|
| <u>12</u> | 78 | 69 | 59 | 64 | 62 | 59 | 100 | 84 | 61 | 30.04 | 29.98 | 29.96 | - | 6 | 2 | 8  | 1 | -  | 0.00 |      |
| <u>13</u> | 79 | 70 | 60 | 64 | 62 | 59 | 100 | 86 | 56 | 29.99 | 29.98 | 29.90 | - | 6 | 0 | 10 | 0 | -  | 0.00 | Fog  |
| <u>14</u> | 78 | 70 | 61 | 64 | 62 | 62 | 100 | 86 | 62 | 29.93 | 29.90 | 29.84 | - | 6 | 0 | 12 | 0 | -  | 0.01 | Fog  |
| <u>15</u> | 78 | 70 | 63 | 65 | 63 | 62 | 100 | 89 | 64 | 29.89 | 29.85 | 29.81 | - | 5 | 1 | 9  | 0 | -  | 0.00 |      |
| <u>16</u> | 88 | 74 | 62 | 67 | 64 | 63 | 100 | 86 | 53 | 29.88 | 29.81 | 29.77 | - | 5 | 1 | 14 | 0 | -  | 0.00 |      |
| <u>17</u> | 75 | 70 | 63 | 66 | 64 | 63 | 100 | 87 | 73 | 29.97 | 29.90 | 29.84 | - | 5 | 2 | 9  | 2 | -  | 0.00 |      |
| <u>18</u> | 77 | 70 | 64 | 66 | 64 | 64 | 100 | 92 | 73 | 30.04 | 29.97 | 29.94 | - | 5 | 2 | 10 | 5 | -  | 0.00 |      |
| <u>19</u> | 80 | 71 | 64 | 67 | 64 | 61 | 100 | 87 | 62 | 30.06 | 30.00 | 29.98 | - | 6 | 2 | 10 | 3 | -  | 0.01 | Rain |
| <u>20</u> | 82 | 73 | 64 | 66 | 64 | 60 | 100 | 88 | 52 | 30.05 | 30.02 | 29.94 | - | 5 | 0 | 12 | 0 | -  | 0.00 | Fog  |
| <u>21</u> | 80 | 70 | 62 | 67 | 64 | 61 | 100 | 88 | 66 | 29.98 | 29.96 | 29.90 | - | 6 | 1 | 10 | 0 | -  | 0.00 |      |
| <u>22</u> | 73 | 66 | 62 | 67 | 66 | 62 | 100 | 90 | 81 | 29.98 | 29.94 | 29.91 | - | 7 | 4 | 9  | 2 | -  | 0.00 |      |
| <u>23</u> | 77 | 68 | 61 | 63 | 62 | 61 | 100 | 88 | 62 | 29.99 | 29.94 | 29.89 | - | 5 | 1 | 10 | 1 | -  | 0.00 |      |
| <u>24</u> | 75 | 68 | 61 | 63 | 61 | 59 | 97  | 84 | 64 | 29.97 | 29.92 | 29.88 | - | 8 | 5 | 10 | 2 | -  | 0.00 |      |
| <u>25</u> | 75 | 68 | 61 | 63 | 60 | 59 | 100 | 82 | 64 | 29.99 | 29.91 | 29.90 | - | 9 | 6 | 13 | 3 | -  | 0.00 |      |
| <u>26</u> | 77 | 70 | 63 | 65 | 63 | 61 | 97  | 83 | 66 | 30.02 | 29.97 | 29.95 | - | 9 | 6 | 12 | 3 | -  | 0.00 |      |
| <u>27</u> | 77 | 69 | 62 | 66 | 62 | 62 | 97  | 85 | 71 | 30.05 | 30.00 | 29.97 | - | 8 | 4 | 13 | 1 | -  | 0.00 |      |
| <u>28</u> | 77 | 68 | 62 | 65 | 62 | 62 | 97  | 90 | 71 | 30.00 | 29.97 | 29.92 | - | 8 | 6 | 12 | 0 | -  | 0.01 | Rain |
| <u>29</u> | 80 | 72 | 64 | 65 | 64 | 62 | 100 | 85 | 62 | 29.98 | 29.93 | 29.90 | - | 8 | 3 | 13 | 2 | -  | 0.00 |      |
| <u>30</u> | 82 | 72 | 63 | 66 | 62 | 62 | 100 | 86 | 54 | 30.03 | 29.95 | 29.94 | - | 8 | 4 | 13 | 2 | -  | 0.00 | Rain |
| <u>31</u> | 77 | 70 | 64 | 66 | 64 | 63 | 96  | 85 | 71 | 30.05 | 30.01 | 29.99 | - | 8 | 3 | 12 | 2 | 16 | 0.00 |      |



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**APPENDIX B**  
**FUEL MODELING**

## Inputs: SURFACE, SPOT, IGNITE

| Description                                | Otay Village Parcel B - Summer |             |
|--------------------------------------------|--------------------------------|-------------|
| <b>Fuel/Vegetation, Surface/Understory</b> |                                |             |
| Fuel Model                                 |                                | gr4, SCAL18 |
| <b>Fuel/Vegetation, Overstory</b>          |                                |             |
| Canopy Height                              | ft                             | 3           |
| <b>Fuel Moisture</b>                       |                                |             |
| Moisture Scenario                          |                                | d111        |
| <b>Weather</b>                             |                                |             |
| 20-ft Wind Speed                           | mi/h                           | 5           |
| Wind Adjustment Factor                     |                                | 0.4         |
| Wind Direction (from north)                | deg                            | 225, 270    |
| Air Temperature                            | oF                             | 90          |
| Fuel Shading from the Sun                  | %                              | 0           |
| <b>Terrain</b>                             |                                |             |
| Slope Steepness                            | %                              | 20          |
| Aspect                                     | deg                            | 180         |
| Ridge-to-Valley Elevation Difference       | ft                             | 0           |
| Ridge-to-Valley Horizontal Distance        | mi                             | 0           |
| Spotting Source Location                   |                                | R11         |

## Run Option Notes

- Maximum reliable effective wind speed limit IS imposed [SURFACE].
- Calculations are only for the direction of maximum spread [SURFACE].
- Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].
- Wind and spread directions are degrees clockwise from north [SURFACE].
- Wind direction is the direction from which the wind is blowing [SURFACE].

## Output Variables

- Surface Rate of Spread (maximum) (ch/h) [SURFACE]
- Flame Length (ft) [SURFACE]
- Spot Dist from a Wind Driven Surface Fire (mi) [SPOT]
- Probability of Ignition from a Firebrand (%) [IGNITE]

(continued on next page)

Otay Village Parcel B - Summer  
Surface Rate of Spread (maximum) (ch/h)

| Fuel Model | Wind Direction (from north) |      |
|------------|-----------------------------|------|
|            | deg                         |      |
|            | 125                         | 270  |
| gr4        | 44.3                        | 39.3 |
| SCAL18     | 27.2                        | 25.4 |

### Otay Village Parcel B - Summer Flame Length (ft)

| Fuel Model | Wind Direction (from north)<br>deg |      |
|------------|------------------------------------|------|
|            | 225                                | 270  |
| gr4        | 7.2                                | 6.8  |
| SCAL18     | 14.9                               | 14.5 |

Otay Village Parcel B - Summer  
Spot Dist from a Wind Driven Surface Fire (mi)

| Fuel Model | Wind Direction (from north) |     |
|------------|-----------------------------|-----|
|            | deg                         |     |
|            | 225                         | 270 |
| gr4        | 0.1                         | 0.1 |
| SCAL18     | 0.2                         | 0.2 |

Otay Village Parcel B - Summer  
Probability of Ignition from a Firebrand (%)

| Fuel Model | Wind Direction (from north) |     |
|------------|-----------------------------|-----|
|            | deg                         |     |
|            | 225                         | 270 |
| gr4        | 89                          | 89  |
| SCAL18     | 89                          | 89  |

## Discrete Variable Codes Used Otay Village Parcel B - Summer

### Fuel Model

|         |                                            |
|---------|--------------------------------------------|
| gr4     | Moderate load, dry climate grass (D) (104) |
| SCAL 18 | Sage / Buckwheat                           |

### Moisture Scenario

|      |                                                      |
|------|------------------------------------------------------|
| d111 | D1L1 - Very low dead, fully cured herb (3,4,5,30,60) |
|------|------------------------------------------------------|



Otay Village Parcel B - Santa Anna  
Surface Rate of Spread (maximum) (ch/h)

| Fuel Model | Wind Direction (from north)<br>deg |       |
|------------|------------------------------------|-------|
|            | 90                                 | 135   |
| gr4        | 351.9                              | 357.4 |
| SCAL18     | 102.9                              | 104.8 |

### Otay Village Parcel B - Santa Anna Flame Length (ft)

| Fuel Model | Wind Direction (from north)<br>deg |      |
|------------|------------------------------------|------|
|            | 90                                 | 135  |
| gr4        | 18.6                               | 18.7 |
| SCAL18     | 27.6                               | 27.8 |

Otay Village Parcel B - Santa Anna  
Spot Dist from a Wind Driven Surface Fire (mi)

| Fuel Model | Wind Direction (from north) |     |
|------------|-----------------------------|-----|
|            | 90                          | 135 |
| gr4        | 0.8                         | 0.8 |
| SCAL18     | 1.1                         | 1.1 |

Otay Village Parcel B - Santa Anna  
Probability of Ignition from a Firebrand (%)

| Fuel Model | Wind Direction (from north) |     |
|------------|-----------------------------|-----|
|            | 90                          | 135 |
| gr4        | 89                          | 89  |
| SCAL18     | 89                          | 89  |

## Discrete Variable Codes Used Otay Village Parcel B - Santa Anna

### Fuel Model

|        |                                            |
|--------|--------------------------------------------|
| gr4    | Moderate load, dry climate grass (D) (104) |
| SCAL18 | Sage / Buckwheat                           |

### Moisture Scenario

|      |                                                      |
|------|------------------------------------------------------|
| d111 | D1L1 - Very low dead, fully cured herb (3,4,5,30,60) |
|------|------------------------------------------------------|

## Inputs: SURFACE, SPOT, IGNITE

|                                      |                                                  |                |
|--------------------------------------|--------------------------------------------------|----------------|
| Description                          | <u>Otay Village Parcel B - Santa Anna - Peak</u> |                |
| Fuel/Vegetation, Surface/Understory  |                                                  |                |
| Fuel Model                           | <u>gr4, SCAL18</u>                               |                |
| Fuel/Vegetation, Overstory           |                                                  |                |
| Canopy Height                        | ft                                               | <u>3</u>       |
| Fuel Moisture                        |                                                  |                |
| Moisture Scenario                    | <u>d111</u>                                      |                |
| Weather                              |                                                  |                |
| 20-ft Wind Speed                     | mi/h                                             | <u>32</u>      |
| Wind Adjustment Factor               |                                                  | <u>0.4</u>     |
| Wind Direction (from north)          | deg                                              | <u>90, 135</u> |
| Air Temperature                      | oF                                               | <u>90</u>      |
| Fuel Shading from the Sun            | %                                                | <u>0</u>       |
| Terrain                              |                                                  |                |
| Slope Steepness                      | %                                                | <u>20</u>      |
| Aspect                               | deg                                              | <u>180</u>     |
| Ridge-to-Valley Elevation Difference | ft                                               | <u>0</u>       |
| Ridge-to-Valley Horizontal Distance  | mi                                               | <u>0</u>       |
| Spotting Source Location             |                                                  | <u>R1</u>      |

## Run Option Notes

Maximum reliable effective wind speed limit is imposed [SURFACE].  
 Calculations are only for the direction of maximum spread [SURFACE].  
 Fireline intensity, flame length, and spread distance are always  
 for the direction of the spread calculations [SURFACE].  
 Wind and spread directions are degrees clockwise from north [SURFACE].  
 Wind direction is the direction from which the wind is blowing [SURFACE].

## Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]  
 Flame Length (ft) [SURFACE]  
 Spot Dist from a Wind Driven Surface Fire (mi) [SPOT]  
 Probability of Ignition from a Firebrand (%) [IGNITE]

(continued on next page)

### Otay Village Parcel B - Santa Anna - Peak Surface Rate of Spread (maximum) (ch/h)

| Fuel Model | Wind Direction (from north)<br>deg |       |
|------------|------------------------------------|-------|
|            | 90                                 | 135   |
| gr4        | 502.0                              | 507.4 |
| SCAL18     | 128.7                              | 130.5 |

### Otay Village Parcel B - Santa Anna - Peak Flame Length (ft)

| Fuel Model | Wind Direction (from north) |      |
|------------|-----------------------------|------|
|            | 90                          | 135  |
| gr4        | 21.9                        | 22.0 |
| SCAL18     | 30.5                        | 30.7 |

Otay Village Parcel B - Santa Anna - Peak  
Spot Dist from a Wind Driven Surface Fire (mi)

| Fuel<br>Model | Wind Direction (from north) |     |
|---------------|-----------------------------|-----|
|               | 90                          | 135 |
| gr4           | 1.1                         | 1.1 |
| SCAL18        | 1.4                         | 1.4 |

Otay Village Parcel B - Santa Anna - Peak  
Probability of Ignition from a Firebrand (%)

| Fuel Model | Wind Direction (from north) |     |
|------------|-----------------------------|-----|
|            | deg                         |     |
|            | 90                          | 135 |
| gr4        | 89                          | 89  |
| SCAL18     | 89                          | 89  |

## Discrete Variable Codes Used Otay Village Parcel B - Santa Anna - Peak

### Fuel Model

|        |                                            |
|--------|--------------------------------------------|
| gr4    | Moderate load, dry climate grass (D) (104) |
| SCAL18 | Sage / Buckwheat                           |

### Moisture Scenario

|      |                                                      |
|------|------------------------------------------------------|
| d111 | D1L1 - Very low dead, fully cured herb (3,4,5,30,60) |
|------|------------------------------------------------------|

**APPENDIX C**  
**FUEL PARAMETERS**

## Fuel Model gr4

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|                                        |                                       |
|----------------------------------------|---------------------------------------|
| Fuel Model Number                      | 104                                   |
| Fuel Model Name                        | gr4                                   |
| Fuel Model Type                        | Dynamic                               |
| Description                            | Moderate load, dry climate grass (D)  |
| 1-h Fuel Load                          | 0.25 tons/ac                          |
| 10-h Fuel Load                         | 0 tons/ac                             |
| 100-h Fuel Load                        | 0 tons/ac                             |
| Live Herbaceous Fuel Load              | 1.9 tons/ac                           |
| Live Woody Fuel Load                   | 0 tons/ac                             |
| 1-h Surface Area/Vol Ratio             | 2000 ft <sup>2</sup> /ft <sup>3</sup> |
| Live Herbaceous Surface Area/Vol Ratio | 1800 ft <sup>2</sup> /ft <sup>3</sup> |
| Live Woody Surface Area/Vol Ratio      | 1500 ft <sup>2</sup> /ft <sup>3</sup> |
| Fuel Bed Depth                         | 2 feet                                |
| Dead Fuel Moisture of Extinction       | 15 percent                            |
| Dead Fuel Heat Content                 | 8000 Btu/lb                           |
| Live Fuel Heat Content                 | 8000 Btu/lb                           |

## Fuel Model SCAL18

---

|                                        |                                       |
|----------------------------------------|---------------------------------------|
| Fuel Model Number                      | 0                                     |
| Fuel Model Name                        | SCAL18                                |
| Fuel Model Type                        | Static                                |
| Description                            | Sage /<br>Buckwheat                   |
| 1-h Fuel Load                          | 5.5 tons/ac                           |
| 10-h Fuel Load                         | 0.8 tons/ac                           |
| 100-h Fuel Load                        | 0.1 tons/ac                           |
| Live Herbaceous Fuel Load              | 0.75 tons/ac                          |
| Live Woody Fuel Load                   | 2.5 tons/ac                           |
| 1-h Surface Area/Vol Ratio             | 640 ft <sup>2</sup> /ft <sup>3</sup>  |
| Live Herbaceous Surface Area/Vol Ratio | 1500 ft <sup>2</sup> /ft <sup>3</sup> |
| Live Woody Surface Area/Vol Ratio      | 640 ft <sup>2</sup> /ft <sup>3</sup>  |
| Fuel Bed Depth                         | 3 feet                                |
| Dead Fuel Moisture of Extinction       | 25 percent                            |
| Dead Fuel Heat Content                 | 9200 Btu/lb                           |
| Live Fuel Heat Content                 | 9200 Btu/lb                           |

**APPENDIX D**

**Chapter 7A of the California Building Code, “Materials and Construction Methods  
for Exterior Wildfire Exposure”**

## CHAPTER 7A [SFM]

# MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE

### SECTION 701A SCOPE, PURPOSE AND APPLICATION

**701A.1 Scope.** This chapter applies to building materials, systems and/or assemblies used in the exterior design and construction of new buildings located within a Wildland-Urban Interface Fire Area as defined in Section 702A.

**701A.2 Purpose.** The purpose of this chapter is to establish minimum standards for the protection of life and property by increasing the ability of a building located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland-Urban Interface Fire Area to resist the intrusion of flames or burning embers projected by a vegetation fire and contributes to a systematic reduction in conflagration losses.

**701A.3 Application.** New buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland-Urban Interface Fire Area designated by the enforcing agency for which an application for a building permit is submitted on or after December 1, 2005, shall comply with the following sections:

1. **704A.1—Roofing**
2. **704A.2—Attic Ventilation**

**701A.3.1 Alternates for materials, design, tests, and methods of construction.** The enforcing agency is permitted to modify the provisions of this chapter for site-specific conditions in accordance with Appendix Chapter 1, Section 104.10. When required by the enforcing agency for the purposes of granting modifications, a fire protection plan shall be submitted in accordance with the California Fire Code, Chapter 47.

**701A.3.2 New buildings located in any fire hazard severity zone.** New buildings located in any Fire Hazard Severity Zone shall comply with one of the following:

1. **State Responsibility Areas.** New building located in any Fire Hazard Severity Zone within State Responsibility Areas, for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all sections of this chapter.
2. **Local Agency Very-High Fire Hazard Severity Zone.** New buildings located in any Local Agency Very-High Fire Hazard Severity Zone for which an application for a building permit is submitted on or after July 1, 2008, shall comply with all sections of this chapter.
3. **Wildland-Urban Interface Fire Area designated by the enforcing agency.** New buildings located in any Wildland-Urban Interface Fire Area designated by the enforcing agency for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all sections of this chapter.

**701A.3.2.1 Inspection and certification.** Building permit applications and final completion approvals for buildings within the scope and application of this chapter shall comply with the following:

**701A.3.2.2** The local building official shall, prior to construction, provide the owner or applicant a certification that the building as proposed to be built complies with all applicable state and local building standards, including those for materials and construction methods for wildfire exposure as described in this chapter.

**701A.3.2.3** The local building official shall, upon completion of construction, provide the owner or applicant with a copy of the final inspection report that demonstrates the building was constructed in compliance with all applicable state and local building standards, including those for materials and construction methods for wildfire exposure as described in this chapter.

**701A.3.2.4** Prior to building permit final approval the property shall be in compliance with the vegetation clearance requirements prescribed in California Public Resources Code 4291 California Government Code Section 51182.

### SECTION 702A DEFINITIONS

For the purposes of this chapter, certain terms are defined below:

**CDF DIRECTOR** means the Director of the California Department of Forestry and Fire Protection.

**FIRE PROTECTION PLAN** is a document prepared for a specific project or development proposed for a Wildland Urban Interface Fire Area. It describes ways to minimize and mitigate potential for loss from wildfire exposure.

The Fire Protection Plan shall be in accordance with this chapter and the California Fire Code, Chapter 47. When required by the enforcing agency for the purposes of granting modifications, a fire protection plan shall be submitted. Only locally adopted ordinances that have been filed with the California Building Standards Commission or the Department of Housing and Community Development in accordance with Section 101.8 shall apply.

**FIRE HAZARD SEVERITY ZONES** are geographical areas designated pursuant to California Public Resources Codes Sections 4201 through 4204 and classified as Very High, High, or Moderate in State Responsibility Areas or as Local Agency Very High Fire Hazard Severity Zones designated pursuant to California Government Code, Sections 51175 through 51189. See California Fire Code Article 86.

The California Code of Regulations, Title 14, Section 1280, entitles the maps of these geographical areas as “Maps of the Fire Hazard Severity Zones in the State Responsibility Area of California.”

**IGNITION-RESISTANT MATERIAL** is any product which, when tested in accordance with ASTM E 84 for a period of 30 minutes, shall have a flame spread of not over 25 and show no evidence of progressive combustion. In addition, the flame front shall not progress more than 10½ feet (3200 mm) beyond the centerline of the burner at any time during the test.

Materials shall pass the accelerated weathering test and be identified as exterior type, in accordance with ASTM D 2898 and ASTM D 3201. All materials shall bear identification showing the fire performance rating thereof. That identification shall be issued by ICC-ES or a testing facility recognized by the State Fire Marshal having a service for inspection of materials at the factory.

Fire-Retardant-Treated Wood or noncombustible materials as defined in Section 202 shall satisfy the intent of this section.

The enforcing agency may use other definitions of ignition-resistant material that reflect wildfire exposure to building materials and/or their materials, performance in resisting ignition.

**LOCAL AGENCY VERY HIGH FIRE HAZARD SEVERITY ZONE** means an area designated by a local agency upon the recommendation of the CDF Director pursuant to Government Code Sections 51177(c), 51178 and 5118 that is not a state responsibility area and where a local agency, city, county, city and county, or district is responsible for fire protection.

**STATE RESPONSIBILITY AREA** means lands that are classified by the Board of Forestry pursuant to Public Resources Code Section 4125 where the financial responsibility of preventing and suppressing forest fires is primarily the responsibility of the state.

**WILDFIRE** is any uncontrolled fire spreading through vegetative fuels that threatens to destroy life, property, or resources as defined in Public Resources Code Sections 4103 and 4104.

**WILDFIRE EXPOSURE** is one or a combination of radiant heat, convective heat, direct flame contact and burning embers being projected by vegetation fire to a structure and its immediate environment.

**WILDLAND-URBAN INTERFACE FIRE AREA** is a geographical area identified by the state as a “Fire Hazard Severity Zone” in accordance with the Public Resources Code Sections 4201 through 4204 and Government Code Sections 51175 through 51189, or other areas designated by the enforcing agency to be at a significant risk from wildfires.

### SECTION 703A STANDARDS OF QUALITY

**703A.1 General.** Material, systems, and methods of construction used shall be in accordance with this Chapter.

**703A.2 Qualification by testing.** Material and material assemblies tested in accordance with the requirements of Section 703A shall be accepted for use when the results and conditions

of those tests are met. Testing shall be performed by a testing agency approved by the State Fire Marshal or identified by an ICC-ES report.

**703A.3 Standards of quality.** The State Fire Marshal standards listed below and as referenced in this chapter are located in the California Referenced Standards Code, Part 12 and Chapter 35 of this code.

**SFM 12-7A-1,** Exterior Wall Siding and Sheathing.

**SFM 12-7A-2,** Exterior Window.

**SFM 12-7A-3,** Under Eave.

**SFM 12-7A-4,** Decking.

### SECTION 704A MATERIALS, SYSTEMS AND METHODS OF CONSTRUCTION

#### 704A.1 Roofing.

**704A.1.1 General.** Roofs shall comply with the requirements of Chapter 7A and Chapter 15. Roofs shall have a roofing assembly installed in accordance with its listing and the manufacturer's installation instructions.

**704A.1.2 Roof coverings.** Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be firestopped with approved materials or have one layer of 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D3909 installed over the combustible decking.

**704A.1.3 Roof valleys.** When provided, valley flashings shall be not less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide (914 mm) underlayment consisting of one layer of 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D3909 running the full length of the valley.

**704A.1.4 Reserved.**

**704A.1.5 Roof gutters.** Roof gutters shall be provided with the means to prevent the accumulation of leaves and debris in the gutter.

#### 704A.2 Attic ventilation.

**704A.2.1 General.** When required by Chapter 15, roof and attic vents shall resist the intrusion of flame and embers into the attic area of the structure, or shall be protected by corrosion-resistant, noncombustible wire mesh with openings a minimum of 1/8-inch (3.2 mm) and shall not exceed 1/4-inch (6 mm) or its equivalent.

**704A.2.2 Eave or cornice vents.** Vents shall not be installed in eaves and cornices.

**Exception:** Eave and cornice vents may be used provided they resist the intrusion of flame and burning embers into the attic area of the structure.

**704A.2.3 Eave protection.** Eaves and soffits shall meet the requirements of SFM 12-7A-3 or shall be protected by ignition-resistant materials or noncombustible construction on the exposed underside.

**704A.3 Exterior walls.**

**704A.3.1 General.** Exterior walls shall be approved noncombustible or ignition-resistant material, heavy timber, or log wall construction or shall provide protection from the intrusion of flames and embers in accordance with standard SFM 12-7A-1.

**704A.3.1.1 Exterior wall coverings.** Exterior wall coverings shall extend from the top of the foundation to the roof, and terminate at 2-inch (50.8 mm) nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure.

**704A.3.2 Exterior wall openings.** Exterior wall openings shall be in accordance with this section.

**704A.3.2.1 Exterior wall vents.** Unless otherwise prohibited by other provisions of this code, vent openings in exterior walls shall resist the intrusion of flame and embers into the structure or vents shall be screened with a corrosion-resistant, noncombustible wire mesh with 1/4-inch (6 mm) openings or its equivalent.

**704A.3.2.2 Exterior glazing and window walls.** Exterior windows, window walls, glazed doors, and glazed openings within exterior doors shall be insulating-glass units with a minimum of one tempered pane, or glass block units, or have a fire-resistance rating of not less than 20 minutes, when tested according to NFPA 257, or in accordance with Section 715, or conform to the performance requirements of SFM 12-7A-2.

**704A.3.2.3 Exterior door assemblies.** Exterior door assemblies shall conform to the performance requirements of standard SFM 12-7A-1 or shall be of approved noncombustible construction, or solid core wood having stiles and rails not less than 1<sup>3</sup>/<sub>8</sub> inches thick with interior field panel thickness no less than 1<sup>1</sup>/<sub>4</sub> inches thick, or shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252, or in accordance with Section 715.

**Exception:** Noncombustible or exterior fire-retardant treated wood vehicle access doors are not required to comply with this chapter.

**704A.4 Decking, floors and underfloor protection.****704A.4.1 Decking.**

**704A.4.1.1 Decking surfaces.** Decking, surfaces, stair treads, risers, and landings of decks, porches, and balconies where any portion of such surface is within 10 feet (3048 mm) of the primary structure shall comply with one of the following methods:

1. Shall be constructed of ignition-resistant materials and pass the performance requirements of SFM 12-7A-4, Parts A and B.
2. Shall be constructed with heavy timber, exterior fire-retardant-treated wood or approved noncombustible materials.
3. Shall pass the performance requirements of SFM 12-7A-4, Part A, 12-7A-4.7.5.1 only with a net

peak heat release rate of 25kW/sq-ft for a 40-minute observation period and:

- a. Decking surface material shall pass the accelerated weathering test and be identified as exterior type, in accordance with ASTM D 2898 and ASTM D 3201 and;
- b. The exterior wall covering to which the deck is attached and within 10 (3048 mm) feet of the deck shall be constructed of approved noncombustible or ignition resistant material.

**Exception:** Walls are not required to comply with this subsection if the decking surface material conforms to ASTM E-84 Class B flame spread.

The use of paints, coatings, stains, or other surface treatments are not an approved method of protection as required in this chapter.

**704A.4.2 Underfloor and appendages protection.**

**704A.4.2.1 Underside of appendages and floor projections.** The underside of cantilevered and overhanging appendages and floor projections shall maintain the ignition-resistant integrity of exterior walls, or the projection shall be enclosed to the grade.

**704A.4.2.2 Unenclosed underfloor protection.** Buildings shall have all underfloor areas enclosed to the grade with exterior walls in accordance with Section 704A.3.

**Exception:** The complete enclosure of under floor areas may be omitted where the underside of all exposed floors, exposed structural columns, beams and supporting walls are protected as required with exterior ignition-resistant material construction or be heavy timber.

**704A.5 Ancillary buildings and structures.**

**704A.5.1 Ancillary buildings and structures.** When required by the enforcing agency, ancillary buildings and structures and detached accessory structures shall comply with the provisions of this chapter.

**APPENDIX E**  
**ACCEPTABLE PLANTS**

**Village 8 West - Fire Protection Planning Area A  
MSCP Buffer Zone**

**Fuel Modification Plant Palette**

October 18, 2010

Existing    Approved

Natives    Village 2

On Site\*    Species\*\*    BOTANICAL NAME - Common Name

---

**LARGE SHRUBS:**

- ◆            ▲            HETEROMELES ARBUTIFOLIA - Toyon
- ◆            ▲            ISOMERIS ARBOREA - Bladder Pod
- ◆            ▲            RHAMNUS CROCEA - Redberry
- ◆            ▲            SIMMONDSIA CHINENSIS - Jojoba
- ◆                       YUCCA SCHIDIGERA - Mojave Yucca

**SUBSHRUBS / PERENNIALS / SUCCULENTS:**

- ◆                       BACCHARIS PILULARIS - Coyote Brush
- ◆            ▲            CYLINDROPUNTIA CALIFORNICA - Snake Cholla
- ◆            ▲            DEINANDRA (HEMIZONIA) FASCICULATA - Fascicled Tarplant
- ◆            ▲            DISTICHLIS SPICATA - Spiked Salt Grass
- ◆                       IVA HAYESIANA - San Diego Marsh-elder
- ◆            ▲            LUPINUS SUCCULENTUS - Arroyo Lupine
- ◆                       MALACHOTHAMNUS FASCICULATUS - Chaparral Bushmallow
- ◆            ▲            NASSELLA PULCHRA - Purple Needlegrass
- ◆            ▲            OPUNTIA LITTORALIS - Coastal Prickly Pear
- ◆                       SALVIA APIANA - White Sage
- ◆            ▲            SISYRINCHIUM BELLUM - Blue-eyed Grass
- ◆            ▲            VIGUIERA LACINIATA - San Diego Sunflower

**SEEDED PLANTS:**

- ◆                       BLOOMERIA CROCEA - Common Goldstar
- ◆            ▲            DEINANDRA (HEMIZONIA) FASCICULATA - Fascicled Tarplant
- ◆                       HAZARDIA SQUARROSA - Sawtooth Goldenfields
- ◆            ▲            LUPINUS SUCCULENTUS - Arroyo Lupine
- ◆                       PLANTAGO ERECTA - Dot-seed Plantain
- ◆            ▲            SISYRINCHIUM BELLUM - Blue-eyed Grass

NOTES:

All listed species are suitable for fuel modification zones

\* Existing species on site per Biological Resources Report by URS, July 26, 2010

\*\* Approved for Villages 2, 3, & portions of 4

# VILLAGE 8 WEST - Fire Protection Planning Area 'B'

## Fuel Modification Plant Palette

October 18, 2010

BOTANICAL NAME / COMMON NAME

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### Trees:

QUERCUS AGRIFOLIA - Coast Live Oak  
QUERCUS ENGELMANNII - Engelmann Oak  
PLATANUS RACEMOSA - California Sycamore

### Shrubs

COMAROSTAPHYLIS D. 'DIVERSIFOLIA' - Summer Holly  
DODONAEA VISCOSA - Hop Bush  
GALVEZIA SPECIOSA - Bush Snapdragon  
HETEROMELES ARBUTIFOLIA - Toyon  
LYCIUM ANDERSONI - Water Jacket  
PRUNUS ILICIFOLIA SP. ILICIFOLIA - Hollyleaf Cherry  
RHAMNUS CROCEA - Redberry  
RHUS INTEGRIFOLIA - Lemonade Berry

### Perennials

AGAVE SPECIES - Agave  
ENCELIA CALIFORNICA - Coastal Sunflower  
ENCELIA FARINOSA - Brittlebush  
SALVIA APIANA - White Sage

### Ground covers

BACCHARIS P. 'PIGEON POINT'  
IVA HAYESIANA - San Diego Poverty Weed

### Seeded Plants

CAMISSONIA CHEIRANTHIFOLIA - Beach Evening Primrose  
DEINANDRA (HEMIZONIA) FASCICULATA - Common Tarplant  
ENCELIA CALIFORNICA - Bush Sunflower  
ERIOPHYLLUM CONFERTIFLORUM - Golden Yarrow  
ESCHSCHOLZIA CALIFORNICA - California Poppy  
GNAPHALIUM BICOLOR - Bicolor Cudweed  
ISOCOMA MENZIESII - Coast Goldenbush  
IVA HAYESIANA - San Diego Poverty Weed  
LASTHENIA CALIFORNICA - Dwarf Goldfields  
LAYIA PLATYGLOSSA - Common Tidy-Tips  
LUPINUS BICOLOR - Minature Lupine  
NASSELLA PULCHRA - Purple Needlegrass  
PHACELIA CAMPANULARIA - California Blue Bells  
SISYRINCHIUM BELLUM - Blue Eyed Grass  
VIGUIERA LACINIATA - San Diego Sunflower

**APPENDIX F**  
**UNDESIREABLE PLANTS**

**List A-1: Most Invasive Wildland Pest Plants; Widespread**

| Latin Name <sup>1</sup>                                                                           | Common Name                         | Habitats of Concern and Other Comments                                                                                       | Distribution <sup>2</sup>                   |
|---------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <i>Ammophila arenaria</i>                                                                         | European beach grass                | Coastal dunes                                                                                                                | SCo,CCo,NCo                                 |
| <i>Arundo donax</i>                                                                               | giant reed, arundo                  | Riparian areas                                                                                                               | cSNF,CCo,SCo,SnGb,D,GV                      |
| <i>Bromus tectorum</i>                                                                            | cheat grass, downy brome            | Sagebrush, pinyon-juniper, other desert communities; increases fire frequency                                                | GB,D                                        |
| <i>Carpobrotus edulis</i>                                                                         | iceplant, sea fig                   | Many coastal communities, esp. dunes                                                                                         | SCo,CCo,NCo,SnFrB                           |
| <i>Centaurea solstitialis</i> <sup>C</sup>                                                        | yellow starthistle                  | Grasslands                                                                                                                   | CA-FP (uncommon in SoCal)                   |
| <i>Cortaderia jubata</i>                                                                          | Andean pampas grass, jubatagrass    | Horticultural; many coastal habitats, esp. disturbed or exposed sites incl. logged areas                                     | NCo,NCoRO,SnFrB,CCo,WTR,SCo                 |
| <i>Cortaderia selloana</i>                                                                        | pampas grass                        | Horticultural; coastal dunes, coastal scrub, Monterey pine forest, riparian, grasslands; wetlands in ScV; also on serpentine | SnFrB,SCo,CCo,ScV                           |
| <i>Cynara cardunculus</i> <sup>B</sup>                                                            | artichoke thistle                   | Coastal grasslands                                                                                                           | CA-FP, esp. CCo,SCo                         |
| <i>Cytisus scoparius</i> <sup>C</sup>                                                             | Scotch broom                        | Horticultural; coastal scrub, oak woodlands, Sierra foothills                                                                | NW,CaRF,SNF,GV,SCo,CW                       |
| <i>Eucalyptus globulus</i>                                                                        | Tasmanian blue gum                  | Riparian areas, grasslands, moist slopes                                                                                     | NCoRO,GV,SnFrB,CCo,SCoRO,SCo,nChi           |
| <i>Foeniculum vulgare</i>                                                                         | wild fennel                         | Grasslands; esp. SoCal, Channel Is.; the cultivated garden herb is not invasive                                              | CA-FP                                       |
| <i>Genista monspessulana</i> <sup>C</sup>                                                         | French broom                        | Horticultural; coastal scrub, oak woodlands, grasslands                                                                      | NCoRO,NCoRI,SnFrB,CCo,SCoRO,sChi,WTR,PR     |
| <i>Lepidium latifolium</i> <sup>B</sup>                                                           | perennial pepperweed, tall whitetop | Coastal, inland marshes, riparian areas, wetlands, grasslands; potential to invade montane wetlands                          | CA (except KR,D)                            |
| <i>Myriophyllum spicatum</i>                                                                      | Eurasian watermilfoil               | Horticultural; lakes, ponds, streams, aquaculture                                                                            | SnFrB,SnJV,SNH(?); prob. CA                 |
| <i>Pennisetum setaceum</i>                                                                        | fountain grass                      | Horticultural; grasslands, dunes, desert canyons; roadsides                                                                  | Deltaic GV,CCo,SCo,SnFrB                    |
| <i>Rubus discolor</i>                                                                             | Himalayan blackberry                | Riparian areas, marshes, oak woodlands                                                                                       | CA-FP                                       |
| <i>Senecio mikanoides</i><br>(= <i>Delairea odorata</i> )                                         | Cape ivy, German ivy                | Coastal, riparian areas, also SoCal (south side San Gabriel Mtns.)                                                           | SCo,CCo,NCo,SnFrB,SW                        |
| <i>Taeniatherum caput-medusae</i> <sup>C</sup>                                                    | medusa-head                         | Grasslands, particularly alkaline and poorly drained areas                                                                   | NCoR,CaR,SNF,GV,SCo                         |
| <i>Tamarix chinensis</i> ,<br><i>T. gallica</i> , <i>T. parviflora</i> &<br><i>T. ramosissima</i> | tamarisk, salt cedar                | Desert washes, riparian areas, seeps and springs                                                                             | SCo,D,SnFrB,GV,sNCoR,sSNF,Teh,SCoRI,SNE,WTR |
| <i>Ulex europaeus</i> <sup>B</sup>                                                                | gorse                               | North, central coastal scrub, grasslands                                                                                     | NCo,NCoRO,CaRF,n&cSNF,SnFrB,CCo             |

**<sup>1</sup>Noxious Weed Ratings**

- F: Federal Noxious Weed, as designated by the USDA; targeted for federally-funded prevention, eradication or containment efforts.
- A: CA Dept. of Food & Agriculture, on "A" list of Noxious Weeds; agency policies call for eradication, containment or entry refusal.
- B: CA Dept. of Food & Agriculture, on "B" list of Noxious Weeds; includes species that are more widespread, and therefore more difficult to contain; agency allows county Agricultural Commissioners to decide if local eradication or containment is warranted.
- C: CA Dept. of Food & Agriculture, on "C" list of Noxious Weeds; includes weeds that are so widespread that the agency does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.
- Q: CA Dept. of Food & Agriculture's designation for temporary "A" rating pending determination of a permanent rating.

For most species nomenclature follows *The Jepson Manual: Higher Plants of California* (Hickman, J., Ed., 1993).

### UNDESIRABLE PLANT LIST

The following species are highly flammable and should be avoided when planting within the first 50 feet adjacent to a structure. The plants listed below are more susceptible to burning, due to rough or peeling bark, production of large amounts of litter, vegetation that contains oils, resin, wax, or pitch, large amounts of dead material in the plant, or plantings with a high dead to live fuel ratio. Many of these species, if existing on the property and adequately maintained (pruning, thinning, irrigation, litter removal, and weeding), may remain as long as the potential for spreading a fire has been reduced or eliminated.

| BOTANICAL NAME                   | COMMON NAME                          |
|----------------------------------|--------------------------------------|
| <u>Abies species</u>             | Fir Trees                            |
| <u>Acacia species</u>            | Acacia (trees, shrubs, groundcovers) |
| <u>Adenostoma sparsifolium**</u> | Red Shanks                           |
| <u>Adenostoma fasciculatum**</u> | Chamise                              |
| <u>Agonis juniperina</u>         | Juniper Myrtle                       |
| <u>Araucaria species</u>         | Monkey Puzzle, Norfolk Island Pine   |
| <u>Artemisia californica**</u>   | California Sagebrush                 |
| <u>Bambusa species</u>           | Bamboo                               |
| <u>Cedrus species</u>            | Cedar                                |
| <u>Chamaecyparis species</u>     | False Cypress                        |
| <u>Coprosma pumila</u>           | Prostrate Coprosma                   |
| <u>Cryptomeria japonica</u>      | Japanese Cryptomeria                 |
| <u>Cupressocyparis leylandii</u> | Leylandii Cypress                    |
| <u>Cupressus forbesii**</u>      | Tecate Cypress                       |
| <u>Cupressus glabra</u>          | Arizona Cypress                      |
| <u>Cupressus sempervirens</u>    | Italian Cypress                      |
| <u>Dodonea viscosa</u>           | Hopseed Bush                         |
| <u>Eriogonum fasciculatum**</u>  | Common Buckwheat                     |
| <u>Eucalyptus species</u>        | Eucalyptus                           |
| <u>Heterotheca grandiflora**</u> | Telegraph Plant                      |
| <u>Juniperus species</u>         | Junipers                             |
| <u>Larix species</u>             | Larch                                |
| <u>Lonicera japonica</u>         | Japanese Honeysuckle                 |
| <u>Miscanthus species</u>        | Eulalia Grass                        |
| <u>Muehlenbergia species**</u>   | Deer Grass                           |
| <u>Palmae species</u>            | Palms                                |
| <u>Picea species</u>             | Spruce Trees                         |
| <u>Pickeringia Montana**</u>     | Chaparral Pea                        |
| <u>Pinus species</u>             | Pines                                |
| <u>Podocarpus species</u>        | Fern Pine                            |
| <u>Pseudotsuga menziesii</u>     | Douglas Fir                          |
| <u>Rosmarinus species</u>        | Rosemary                             |
| <u>Salvia mellifera**</u>        | Black Sage                           |
| <u>Taxodium species</u>          | Cypress                              |
| <u>Taxus species</u>             | Yew                                  |
| <u>Thuja species</u>             | Arborvitae                           |
| <u>Tsuga species</u>             | Hemlock                              |
| <u>Urtica urens**</u>            | Burning Nettle                       |

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\*\* San Diego County native species

**References:** Gordon, H. White, T.C. 1994. Ecological Guide to Southern California Chaparral Plant Series. Cleveland National Forest.

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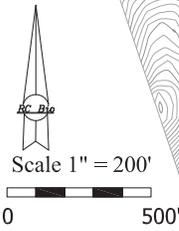
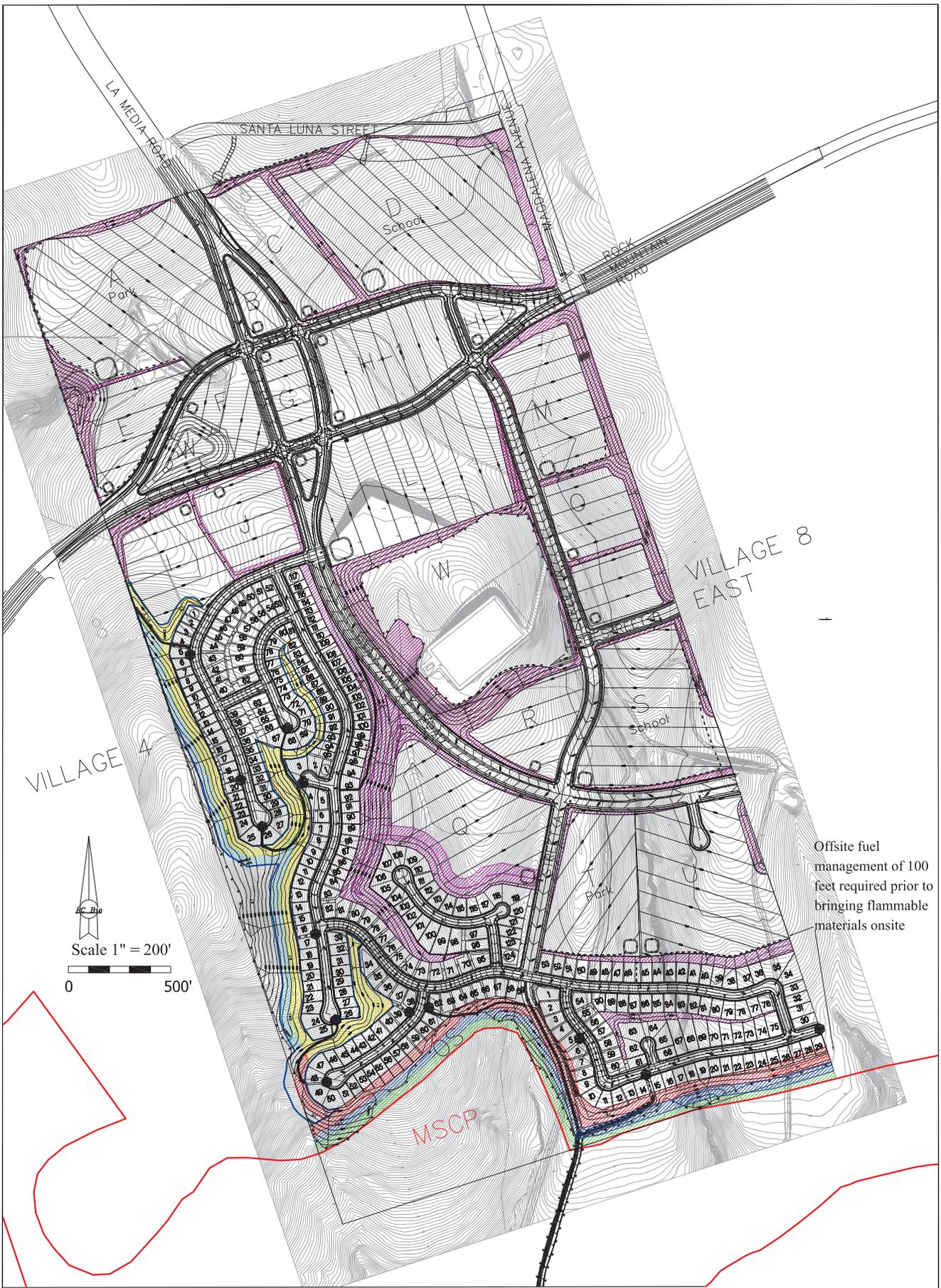
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Offsite fuel management of 100 feet required prior to bringing flammable materials onsite

| Fire Protection Planning Area A                                                                                                                                                                                                                                                                                                                   | Fire Protection Planning Area B                                                                                                                                                                                             | Fire Protection Planning Area C                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li> Fuel Management Zone 1: Minimum of 50 Feet Low-Fuel, Native Plants</li> <li> Fuel Management Zone 2: Additional 50 Feet beyond Zone 1 shrub clusters limited to 400 sq. feet</li> <li> Fuel Management Zone 3: balance of distance to total 150 Feet shrub clusters limited to 400 square feet</li> </ul> | <ul style="list-style-type: none"> <li> Fuel Management Zone 1: 0-50 Feet Low-Fuel, Native Plants</li> <li> Fuel Management Zone 2: 51-100 Feet 4 feet or less in height, shrub clusters limited to 400 sq. feet</li> </ul> | <ul style="list-style-type: none"> <li> Fuel Management Zone 2: 6-Varies: Depth of FMZ based on top and toe of manufactured, interior slopes. Native or ornamental plants. See Landscape Plans for details.</li> </ul> |

— MSCP Limit  
● Fire Fighter Access Points