



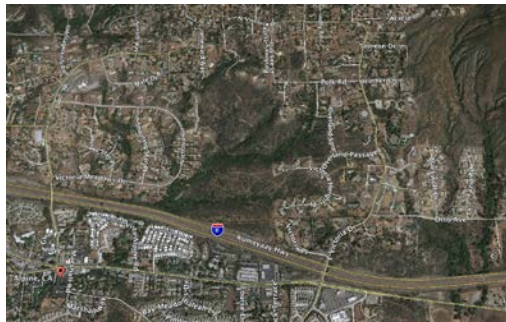
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## ALPINE 21 TENTATIVE MAP

CHELSEA MEADOWS ROAD

ALPINE, CA. 91901

PROJECT ID NUMBERS: TM 5431 PDS 403-160-11 AND 15

ENVIRONMENTAL LOG # PDS-2005-3100-5431-ALPINE 21

**REVISED NOVEMBER 2019**

PREVIOUS ITERATIONS: October 12, 2016; January, 25 2019

APPLICANT: ALPINE 21 LLC  
5295 Beachcomber Court  
San Diego, CA 92130.

***Prepared for the County of San Diego***

by

*J. Charles Weber*

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## **CHAPTER 1 INTRODUCTION**

This Fire Protection Plan (FPP) has been prepared for the ALPINE 21 Tentative Map TM 5431, located at Alpine, CA. The purpose of the FPP is to assess the potential impacts resulting from wildland fire hazards and identify the measures necessary to adequately mitigate those impacts. As part of the assessment, the Plan has considered the property location, topography, geology, combustible vegetation (fuel types), climatic conditions, and fire protection systems and equipment, impacts to existing emergency services, defensible space and vegetation management. The plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends methods of treatments that will protect one or more at-risk communities and essential infrastructures. The Plan recommends measures that property owners will take to reduce the probability of ignition of structures throughout the area addressed by the Plan.

### **1.1 Project Location, Description and Environmental Setting**

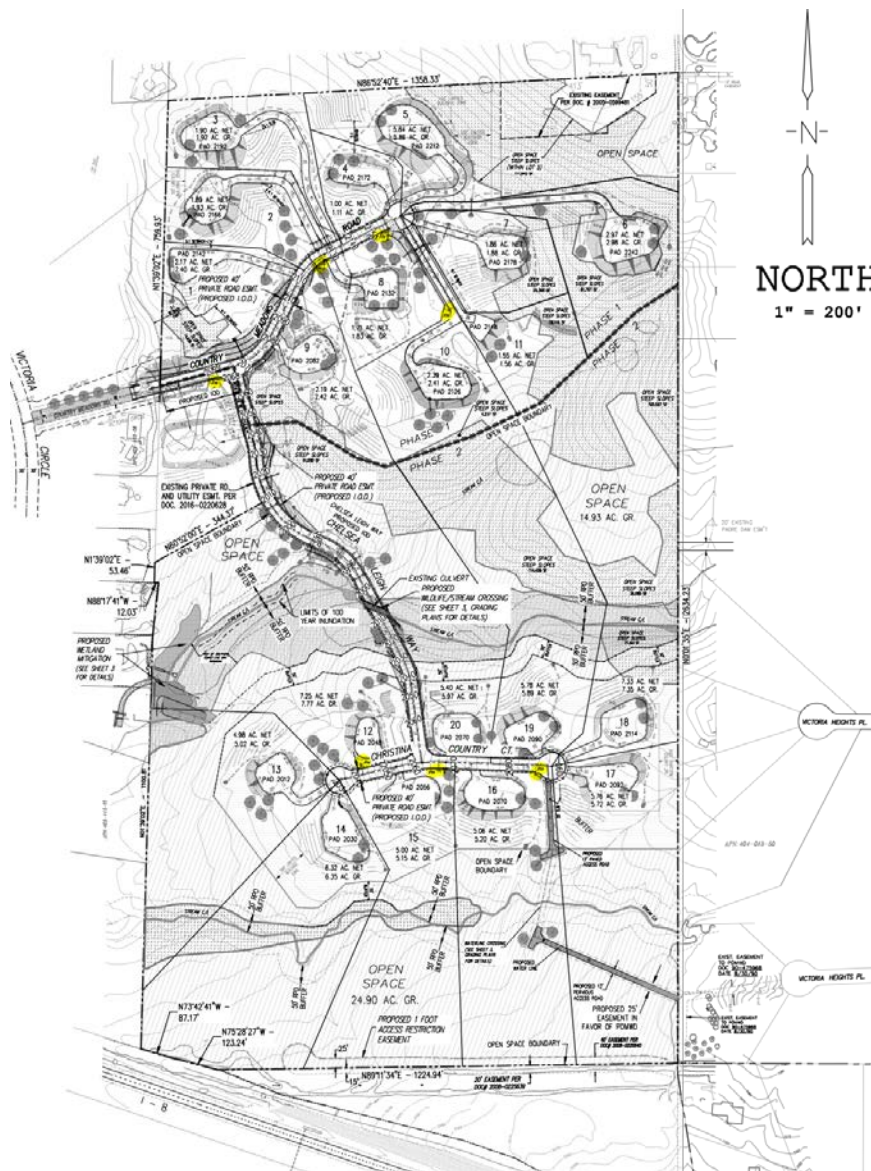
#### **1.1.1 Project Location**

The proposed project site is within the unincorporated community of Alpine, approximately twenty-six (26) miles east of the Pacific Ocean and 19 miles north of the United States-Mexican International Border in San Diego County, California.

The Project is located north of the Interstate 8 highway corridor, west of East Victoria Drive, and east of West Victoria Drive and Victoria Circle. Access to the project site is from the intersection of Country Meadows Road and Victoria Circle.

Alpine is primarily a semi-rural residential community with 5536 housing units and a population of approximately 16,468 people.

The Project Site is located in lands designated by the CAL-FIRE Fire and Resource Assessment Program as a Very High Fire Severity Area (VHSFA). It is also in lands designated as State Responsibility Area (SRA), in which CAL-FIRE has primary responsibility for suppressing wild fire incidents. The Project is within the service area of the Padre Dam Municipal Water District.



**Figure 1.1.1 - Proposed Project Map - TM-5431 Alpine 21**



### **1.1.2 Project Description**

The Project is currently undeveloped land on two parcels measuring approximately eighty-three (83) acres of land. There is existing single family residential development on the north, west and east sides of the project. The Interstate 8 highway corridor abuts the southern property line of the Project site. The Project site has been zoned for Limited Agriculture (A-70) and has a proposed General Plan designation as SR-1 Semi-Rural.

The Project site is rectangular in shape, the long side having a south-to-north configuration. The south side of the site has a significant depression immediately adjacent to the Interstate 8 right-of-way that forms a bowl-like land formation. A natural creek bed runs through this depression in a northeast to southwest configuration. North of the creek drainage, the landscape projects upward to the north and some areas qualify as Steep Slopes areas. There are three major drainages that traverse the northern area of the Project site.

#### **1.1.2.1 Proposed Project Use**

The Project will sub-divide the two parcels into twenty (20) residential lots. The Project will provide three (3) Open Space tract areas (A, B, and C) at the northwest corner, center, southwest and southern portions.

The Project intends to place eleven (11) single family dwellings (lots 1-11) in the northern half of the site. All of the houses will be placed along the right-of-way of the extended Country Meadows Road and will be accessed from long driveways.

The remaining proposed single family dwelling building sites (Parcels 12-20) are located south of the transecting Open Space Easement. Christina Country Court forms a “tee” intersection just south of Open Space Easement “B” and continues as a west-to-east configured street. There are terminal cul-de-sacs at the west and east ends of the street.

#### **Parcel Sizes**

The Project proposes the following Parcel Sizes in two (or more) construction Phases:

Phase 1 – Northern half of Project Site:

- Lot # 1 – 2.35 acres
- Lot # 2 – 1.93 acres
- Lot # 3 – 1.92 acres
- Lot # 4 – 1.11 acres
- Lot # 5 – 2.71 acres

- Lot # 6 – 2.98 acres
- Lot # 7 – 1.88 acres
- Lot # 8 – 1.83 acres
- Lot # 9 – 2.48 acres
- Lot # 10 -2.41 acres
- Lot # 11 – 1.56 acres

Phase 2 – Southern Half of Project Site

- Lot # 12 – 7.77 acres
- Lot # 13 – 5.02 acres
- Lot # 14 – 6.35 acres
- Lot # 15 – 5.15 acres
- Lot # 16 – 5.2 acres
- Lot # 17 – 5.76 acres
- Lot # 18 – 7.35 acres
- Lot # 19 – 5.89 acres
- Lot # 20 – 5.97 acres

**1.1.2.2 Location of Easements**

**Power Utilities** – San Diego Gas & Electric Company maintains easements for underground electrical distribution conduits and lines running beneath the existing streets and parcels of the established sub-division west of the Project Site.

**Sewer** - existing and proposed sewage disposal is (will be) accomplished through the use of approved septic systems and leech fields.

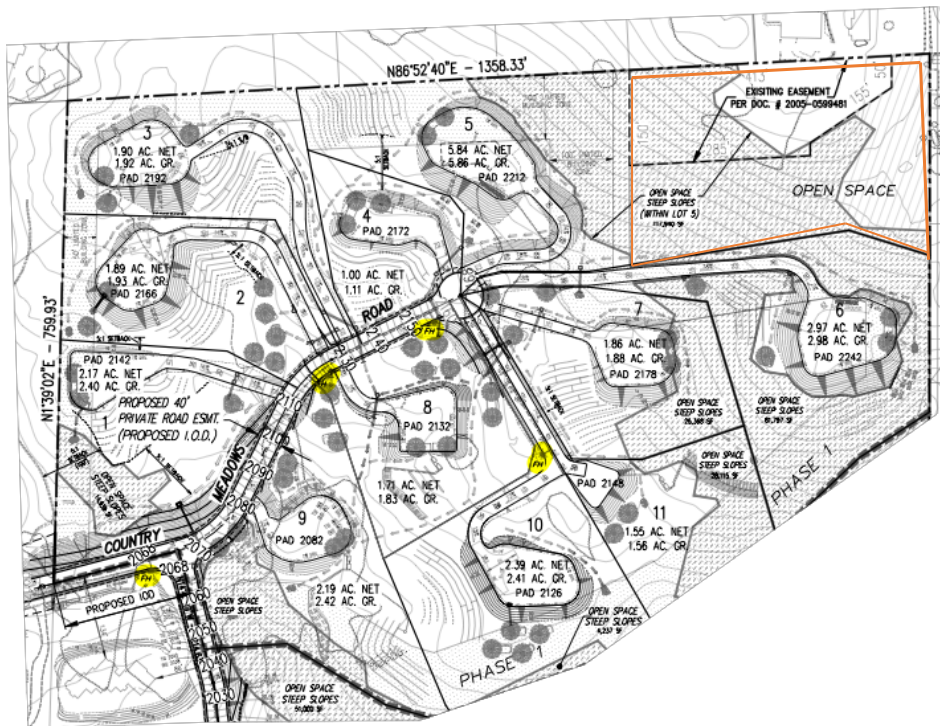
**1.1.2.3 – Open Space and Riparian Areas**

There are three Open Space Easements assigned to the Project site (see Figure 1.1.1).

The Northern Open Space Easement is a 3.15 -acre parcel at the northeast corner of the Project Site. It is contiguous with the north and eastern property lines of the site.

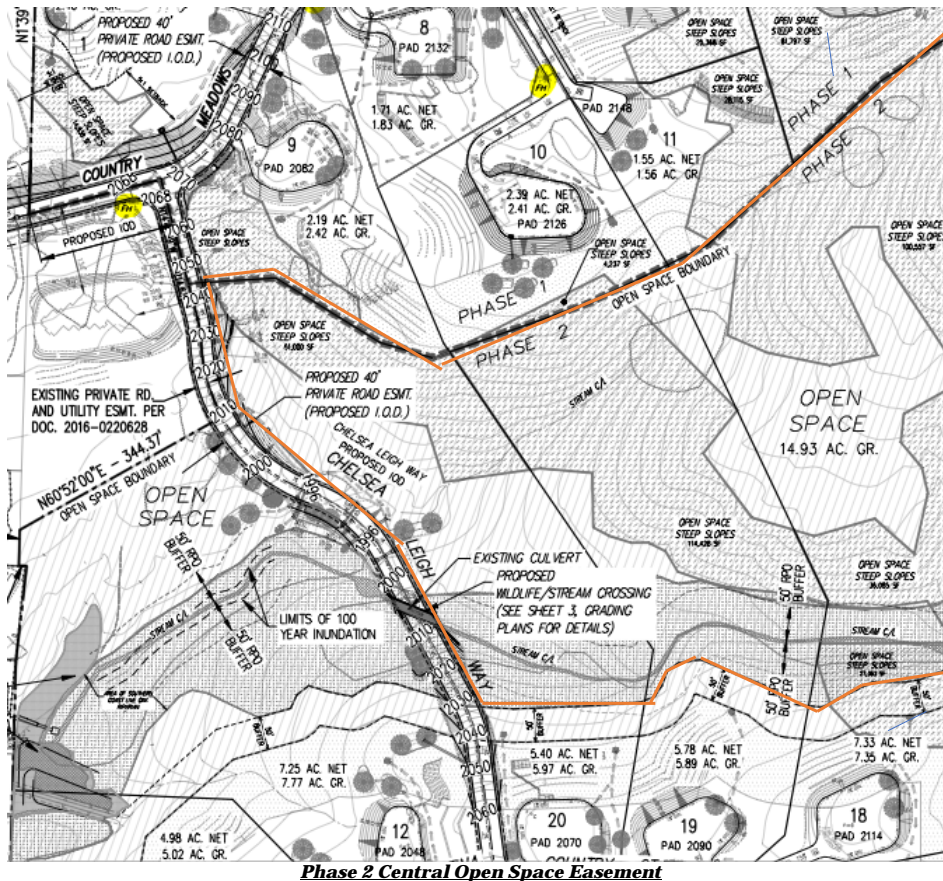
The following parcels in the Phase I Northern Development Area of the Project have areas inside of the Lot perimeters that are now designated as Open Space-Steep Slope Lands:

- Lot # 5
- Lot # 6
- Lot # 7
- Lot # 9
- Lot # 11



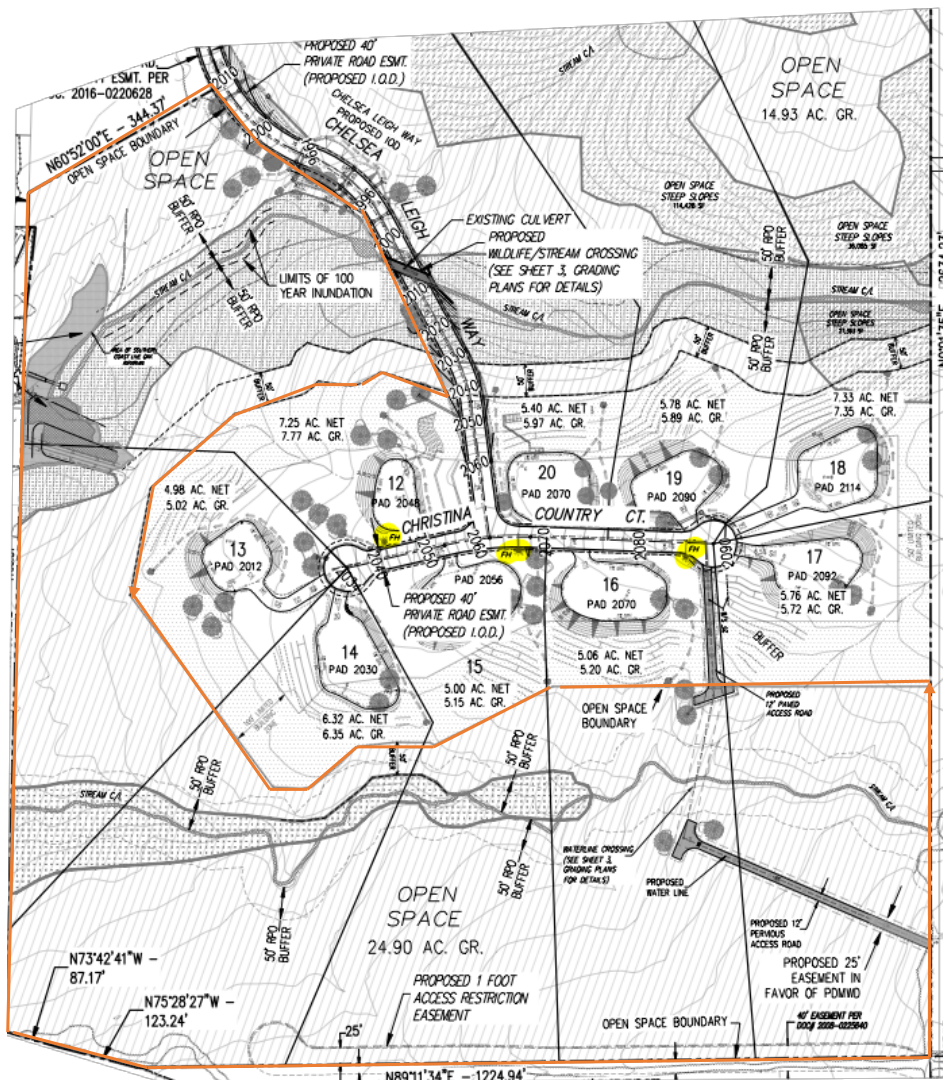
**Northern Open Space Easement**

The Central Open Space Easement has 14.89 acres and is south of the proposed residences on Country Meadows Road. This easement is on both sides of Chelsea Leigh Way and roughly follows the path of the transecting creek bed drainage. The Easement is bordered to the south by the homes proposed in the southern portions of the Project site.



The Southern Open Space Easement is a 25-acre parcel. It begins on the west side of Chelsea Leigh Way and wraps around the proposed southern residential development area in a southwest configuration between the Project site's western, south and eastern property lines.





***Phase 2 Southern Open Space Easement***

#### **1.1.2.4 – Off-Site Improvements**

The Project site is bordered on three sides (west, north and east) by existing single family residences that were either part of sub-division developments or erected as single projects. The Interstate 8 right-of-way passes in an east-to-west swath across the southern border of the Project Site. South of Interstate 8, the land has been developed as a combination of commercial-industrial or residential buildings.



***Single Family Dwellings Accessed from East Victoria Drive on Ridge Line, East of Project***



***Typical Single Family Dwellings on Ridgeline Accessed from East Victoria Drive***

*(North & Northeast of Project) and in Subdivision West of Project*

#### **1.1.2.4.1 – Roads**

The primary access point to the Project site is from the intersection of West Victoria Drive and Victoria Meadows Road. From this intersection, the Project Site can be reached by proceeding in an easterly direction on Victoria Meadows Drive to the intersection of Victoria Circle. Victoria Circle intersects with the existing portions of Country Meadows Lane, which gives access to the proposed Project Site.

The secondary access point to the Project is from the intersection of West Victoria Drive and Victoria Circle. From this intersection, the Project Site is reach by traveling east and southeast on Victoria Circle to its intersection with Country Meadows Road.

#### **1.1.2.4.2 – Utilities**

Power: Electrical energy will be provided to the Project site by San Diego Gas & Electric Company, a Sempra Energy division.

Telephone Services: Hard-wired telephone services in the vicinity of the Project Site are provided by AT&T.

Sewer Service: Sewage disposal for the Project site is proposed as on-site septic systems.

Water: The project site will be served by the Padre Dam Municipal Water District.

### **1.1.3 Environmental Setting**

#### **1.1.3.1 Dates of Site Inspections/Visits**

##### **Site Visit #1, April 3, 2016**

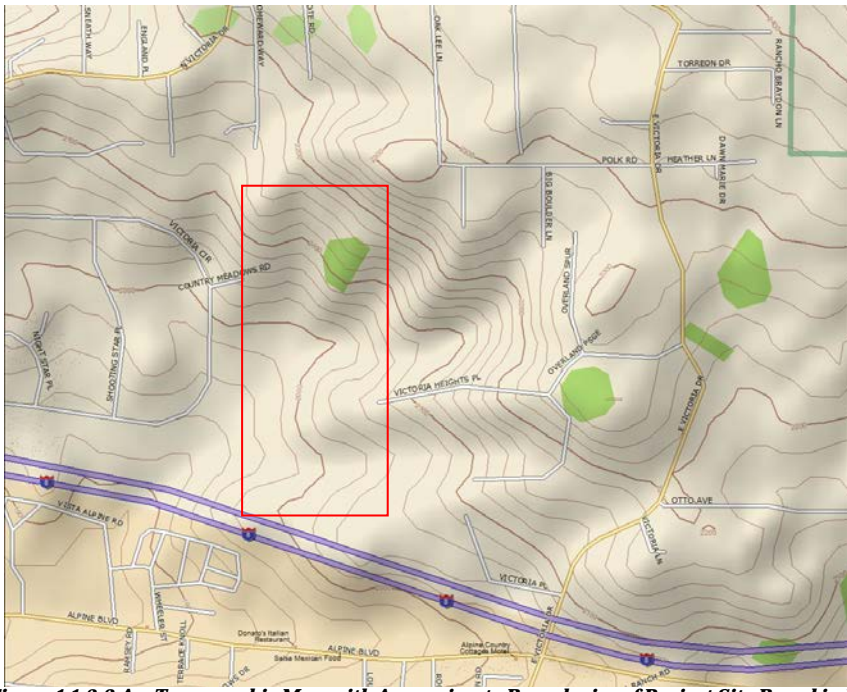
- Project site familiarization
- Initial site photographs
- Response route time trials

##### **Site Visit # 2, April 10, 2016**

- Vegetation evaluation – fuel model types, fuel density and height measurements
- Additional site photography



### 1.1.3.2 Topography



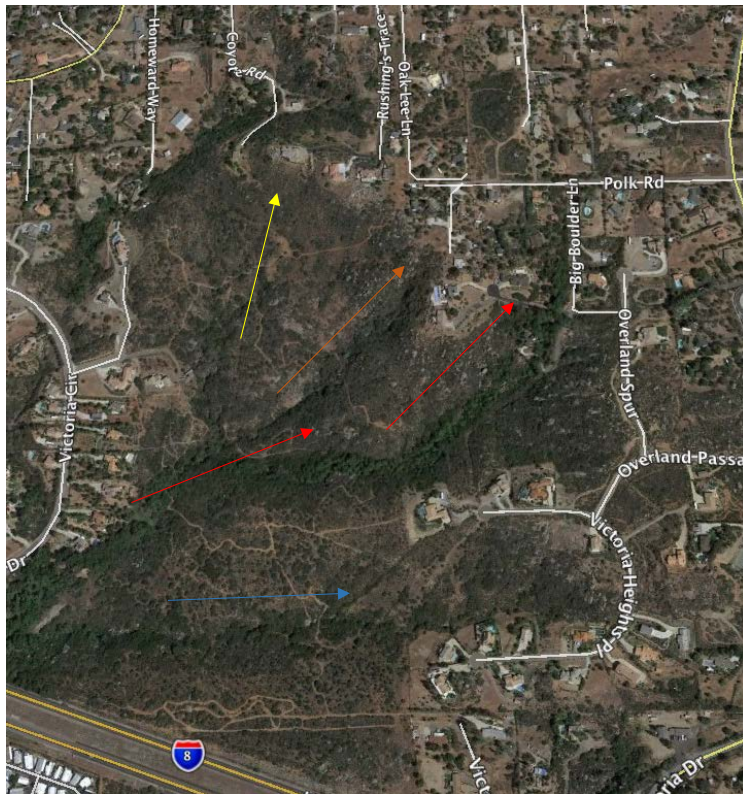
**Figure 1.1.3.2.A - Topographic Map with Approximate Boundaries of Project Site Boxed in Red**

The Project Site is located on the north side of the Interstate 8 right-of-way corridor. West of the Project Site, the landscape begins forming a roughly triangular shape bowl depression, with the base parallel to Interstate 8 and stretching in a west to east direction. The depression angles to the northeast, skirting the route of Victoria Circle to just south of Country Meadows Road. The eastern leg of the bowl moves in a northwesterly direction from the vicinity of Victoria Place, passing Victoria Heights Place and wrapping around to meet the western leg just south of Country Meadows Place.

Four major drainages, including a riparian vegetated creek bed, fan out from the topographic depression with associated moderately steep and extremely steep slopes.

Three of these drainages (ORANGE, RED and BLUE arrows) have a southwest to northeast configuration, placing them in direct alignment with both extreme Santa Ana northeast winds and typical summer late afternoon winds from the southwest. These drainages are primarily on the eastern side of the Project Site.

The fourth drainage (YELLOW arrow) is on the west side of the Project Site and has a south-to-north configuration. This drainage runs parallel to the south-to-north right-of-way leg of Victoria Circle before it reaches Country Meadows Road. The drainage continues upslope past Country Meadows Road and stretches to a meadow area bordered by Polk Road to the east and Oak Lee Lane to the north.



**Figure 1.1.3.2.B – Location of Major Drainages on Project Site**

### **Topographic Influence of Viejas Mountain**

Viejas Mountain (BLUE arrow) lies east and northeast of the Project Site (YELLOW arrow) and has a roughly triangular shape on all aspects. The mountain is approximately two (2) miles long on its south-to-north axis and the peak has an elevation point of 4187 feet Above Sea Level (ASL). This places the majority of the mountain looming approximately 2000 feet above the highest point on the project site. The west facing slope of Viejas Mountain has a slope of approximately 39% and slopes downward toward the East Victoria Drive area over a distance of approximately one mile (5178 feet).



***Relationship of Viejas Mountain to Project Site***

During normal summer months with usual south and southwest winds, the mass of Viejas Mountain will act as a diurnal heat sink source for the area. With its broad slopes, the exposed ground will absorb solar energy, producing strong up-canyon winds over a considerable distance. Fire starting at the base of the mountain will be pulled upslope and through the varying patchy and compact vegetative fuel beds on the slopes. The thermal heat sink will also impact fires starting at some distance from the actual mountain, also drawing fire in an easterly and northeasterly direction by the natural convection currents caused by solar heating of the ground and plant life.

During Santa Ana/Northeasterly wind events, Viejas Mountain might be expected to block the path of the wind pattern by its long and massive shape rising above the surrounding landscape. Fire history in the area (most recently, the 2003 Cedar Fire) supports this hypothesis.

Santa Ana Wind Events are caused by an atmospheric High Pressure Zone occurring in the desert plains in the Northern Nevada and Utah areas, with a corresponding Low Pressure Zone in place off-shore of San Diego, and other parts of Southern California, over the Pacific Ocean. Seeking atmospheric equilibrium, the zone of High Pressure migrates toward the Low Pressure Zone, forming wind plumes. As the wind plumes move towards Southern California, it descends from the upper elevations over Nevada, causing adiabatic compression of the air mass. The compression forces creates an increase of temperature of approximately five (5•) degree for every 1000 feet of elevation drop. An average elevation change of 5000 feet from the Nevada plains to Sea Level will produce a twenty-five (25•) degree increase of air temperature.

The bulk of Viejas Mountain will force the descending air mass over its bulk for varying distances. However, Santa Ana wind events tend to produce unpredictable wind behavior and the air mass, held temporarily aloft by the mass of Viejas Mountain, can, without warning, violently “surface” in a manner similar to the severe downdrafts common in thunderstorms. This results in extreme, wind-drive fire behavior across the ground surface and can cause a 180-degree wind shift, moving the fire rapidly in another direction.

During the 2003 Cedar Fire, the north side of Viejas Mountain absorbed the brunt of the northeast winds, causing extreme fire behavior and “blow-up” conditions over a large area of the mountain.

Decadent, thirty-plus (30+) year old vegetation was exposed to high winds (30 to 40 mile per hour at the surface), which drove a long flame front directly up the slopes. Daily heating of the fuel and soils on the slope pre-heated the vegetation before the arrival of the flame front. The dessicating northeastern winds pre-heated the vegetation, further depleting its fuel moisture content. The arrival of the flame front on the northern slope

triggered several incidences of Area Ignition, especially in canyons and drainages, where large tracts of acreage simultaneously ignited over a short period of time.

The fire lofted burning embers aloft and deposited them over the peak of the mountain in receptive vegetation on the downwind side. Numerous spot fires erupted and, under the influence of normal diurnal slope heating, back-burned up the slope at slower rates of spread than the flame front on the wind exposed north and eastern sides of Viejas Mountain. A strong firefighting Structure Protection Group, assembled along Victoria Drive, kept the fire from spreading into the Victoria and Project areas.

#### **1.1.3.3 Vegetation**

Vegetation on the Project Site is a mixture of Southern California Chaparral shrub and brush types and riparian growth and trees along the creek bed drainages at the center and southern sides of the development area.

The vegetative fuels have uninterrupted continuity and fuel heights exceeding ten feet over extended areas of the Site. The estimated fuel age is forty plus (40+) years; a large amount of the vegetation appears to be in a decadent state, with a high dead-to-live fuel ratio.





***Typical Fuel Height on Project Site – comparison with 6-foot tall fuel measuring stick***

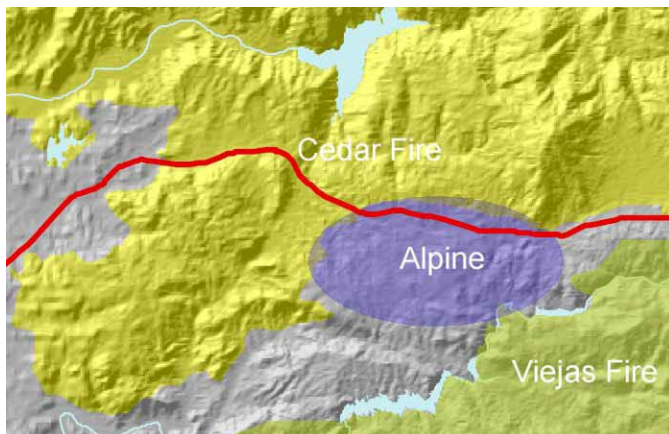


*Typical Fuel Types, Loading and Heights on Project Site*

#### **1.1.3.3 Fire History**

The Community of Alpine has experienced numerous wildfires in the past.





The map shows the boundaries of the two most recent major fires.

The Viejas Fire of January 2001 passed just to the south of several heavily populated areas of town.

The Cedar Fire of October 2003, while passing just to the north of the most heavily populated areas of town, destroyed a large number of homes in the Peutz Valley and Harbison Canyon.

In the past forty-five years, there have been several wildland fires that have directly impacted the area around the Project Site:

- 1970 – Laguna Fire – started on September 26 and burned through the Alpine Community on September 27<sup>th</sup>. The fire burned a total of 175,425 acres. The Laguna fire destroyed 382 homes in San Diego County and passed through an unpopulated region of Alpine. In addition to the ten homes burned in Alpine, 114 were destroyed in Harbison Canyon and another 117 were lost in Crest.
- 2003 – Cedar Fire – started on October 25<sup>th</sup> and burned through parts of the Alpine community, Harbison Canyon and Crest. 2,232 homes were destroyed County-wide and the fire consumed 280,278 acres before it was controlled almost two weeks later. The weather conditions at the USFS Alpine Remote Automated Weather Station on October 26, 2003 were 86 degrees, wind speed at 26 mph, relative humidity 4% and fuel moisture average 4%.
- 2018 – West Fire – started on July 6, 2018 under extreme fire weather conditions. The fire generally burned in a northeast-to-southwest direction with

rapid to extreme rates of spread in vegetative fuels that had not burned since the 1970 Laguna Fire. 505 acres were burned, with fifty-six (56) structures, including thirty-four (34) residences and one (1) commercial building, were destroyed. The northwest perimeter of the West Fire was approximately one-half-mile southeast of the southeast corner of the Project Site.



Commented [CW1]:

Commented [CW2]:

The Project Site was not impacted by the burn perimeters of the Laguna, Viejas, Cedar or West Fires.

#### 1.1.3.4 Climate

Like most of Southern California, San Diego County and the project site has a Mediterranean Climate typified by warm to hot dry summers and mild to cool winters. Summer temperatures range between the mid-nineties and low one hundreds during the summer and fall months with occasional extraordinarily hot, dry spells similar to desert conditions occurring.

Rainfall averages nine to fifteen inches at the lower elevations where the project site is located.

Santa Ana winds are one of the most notable weather conditions in Southern California and San Diego County. Typically, these dry winds occur during the late summer and fall months (September through November) but may happen at any time during the year. With combined adiabatic (compression) heating (for every 1000 feet of elevation decline, temperature increases five degrees) and wind velocities exceeding 40 miles per hour, Santa Ana winds severely exacerbate wildfires, especially during drought conditions.

The U.S. Forest Service Weather Information Management System provides information about weather patterns in San Diego County. Daily afternoon weather observations in San Diego County were analyzed for forty-four years (1961-2005) at selected fire stations.

San Diego County is divided into five climate zones between the coast and desert. Weather data between April and December are used to represent the annual fire season in San Diego County, with the most severe fire weather conditions in September and October.

The following table was derived by the analysis of San Diego County's Interior Climate Zone where the project is located.

**Worst Case Weather and Burning Conditions, Interior Zone**

<b>Period</b>	<b>Temperature</b>	<b>Humidity</b>	<b>Wind Speed</b>	<b>Burning Index</b>
Summer	90-109	5-9%	18 mph	153
Santa Ana	90-109	5-9%	24 mph	168
Peak	90-109	5-9%	56 mph	-

**1.1.3.5 Land Ownership**

The Project site is currently owned by Alpine 21 LLC, 5295 Beachcomber Court, San Diego, CA 92130.

All lands surrounding the Project site are essentially single family residences owned by individual private owners.

**1.1.3.6 Existing Land Uses**

The Project site is bordered on three sides (west, north and south) by existing single family residences that were either part of sub-division developments or erected as one time projects.

The Interstate 8 right-of-way passes in an east-to-west swath across the southern border of the Project Site.

South of Interstate 8, the land has been developed as a combination of commercial-industrial or residential buildings.

#### **1.1.3.7 Proposed Land Uses**

The Project site is currently zoned as Land Use A-70, Limited Agricultural.

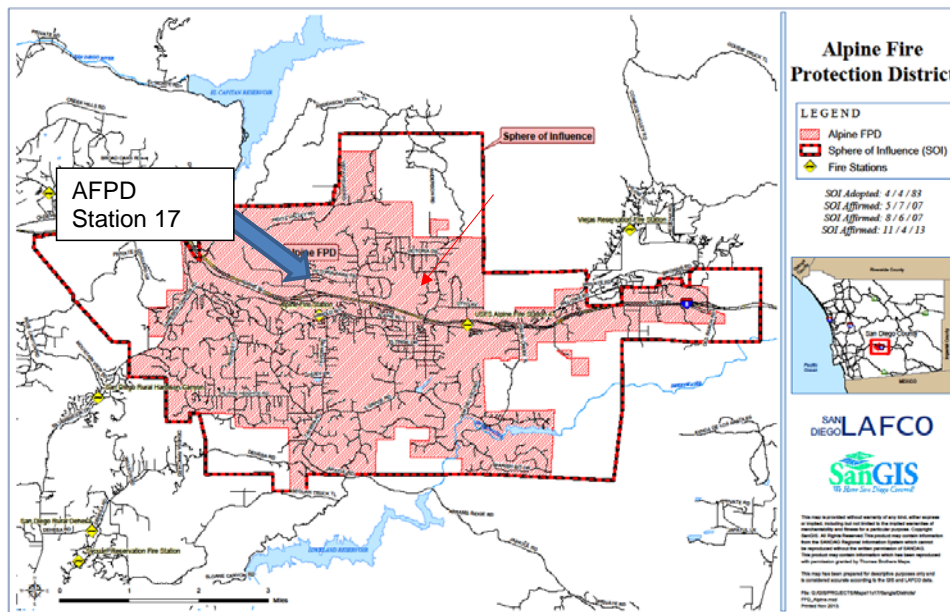
The Alpine 21 Residential Development land use will be designated as SR-1 Semi-Rural Residential.

## **CHAPTER 2 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE**

### **2.1 Emergency Services – Availability and Travel Time**

#### **2.1.1 Emergency Services Availability**

The Project is within the Sphere of Influence and jurisdictional boundaries of the Alpine Fire Protection District.



**Alpine Fire Protection District Map Red Arrow –Project Site Location**

The Fire District is an “all risk” career agency providing 24-7-365 fire protection services to an area of approximately 27.5 square miles. The community was recently evaluated by the Insurance Services Office, resulting in an upgraded fire protection rating from 3/8b to 2/2Y.

The District has one fire station housing a Type I Structure Fire Engine, a Type III Brush Fire Engine and one paramedic ambulance. Station 17 is manned by four (4) career firefighters that cross-staff the Type I and Type III engines and two private company EMS personnel assigned to the paramedic ambulance. Medic 17 currently serves the Project Site for emergency medical services under a County of San Diego contract with Mercy Medical Response.



*Alpine FPD Station 17*

The project site is approximately 1.78 miles from Alpine Fire Protection District Station 17.

#### **2.1.2 – Travel Time**

The project site is located approximately 1.78 miles from the closest permanently staffed Fire Station (Alpine FPD Station # 17).

Using the NFPA 1142 response time formula, assuming a constant 35 mile per hour travel speed, the County of San Diego estimates a response time for fire apparatus driving from Station 17 to the project site is approximately four minutes.

Table S-1 Travel Time Standards from the Closest Fire Station*		
Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	<ul style="list-style-type: none"> <li>Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-0.5 and SR-1)</li> <li>Commercial and Industrial Designations in the Village Regional Category</li> <li>Development located within a Village Boundary</li> </ul>	In general, this travel time standard applies to the County's more intensely developed areas, where resident and business expectations for service are the highest.
10 min	<ul style="list-style-type: none"> <li>Semi-Rural Residential Areas (&gt; SR-1 and SR-2 and SR-4)</li> <li>Commercial and Industrial Designations in the Semi-Rural Regional Category</li> <li>Development located within a Rural Village Boundary</li> </ul>	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes and longer distances make it difficult to achieve shorter travel times.
20 min	<ul style="list-style-type: none"> <li>Limited Semi-Rural Residential areas (&gt;SR-4, SR-10) and Rural Lands (RL-20)</li> <li>All Commercial and Industrial Designations in the Rural Lands Regional Category</li> </ul>	In general, this travel time is appropriate for very low-density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.

Table 5-1, Travel Time Standards, from the County of San Diego General Plan's Safety Element indicates that a maximum response time of five (5) minutes is allowed for Single Family Dwellings in Land Use Designations SR0.5 and SR-1, Semi-Rural Residential Areas.

**Finding:** The Alpine Fire Protection District's Form PDS-399-F Project Facility Availability – Fire form, shows the Project site has a response distance from Station 17 of 1.8 miles, with a response time of 3.5 minutes.

**Finding:** The Project is in compliance with the General Plan's Emergency Response Time criteria.

To confirm these Findings, response travel time trials were conducted during the April 3, 2016 site visit. The travel times were timed on two separate stopwatches under normal, **non-emergency** driving conditions with normal traffic patterns encountered on the response routes used to reach the project site, with the following results

- Average response time from Station 17 to Project Site, travel route Tavern Road to Arnold Way to Alpine Blvd., Alpine Blvd to West Victoria Road and West Victoria to Country Meadows Road was four minutes.
- MapQuest projected travel time using this route was 3.78 minutes.

Fire Apparatus from the Alpine Fire District have three (3) separate routes that can be used for a response to the project site.



### **Route # 1**

Fire apparatus respond from Station 17 and proceed north on Tavern Road to Alpine Blvd. They would turn east (right) on Alpine Blvd and then proceed to West Victoria Drive. At West Victoria Drive, apparatus will turn north (left) and follow the road in a northeasterly direction to Victoria Meadows Drive, which will be followed to Victoria Circle. Apparatus will follow Victoria Circle until arriving at Country Meadows Road, the main entry point to the the Project.

---

**Finding:** *This response route is 1.7 miles long. Traveling under non-emergency conditions and obeying all speed limits along the route, the driving time between Station 17 and the entrance to the Project Site is three-and-one-half (3:30) minutes.*

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### **Route # 2**

Fire apparatus respond from Station 17 and proceed along Tavern Road to Arnold Way. They would turn east (right) on Arnold Way and then proceed to the three-way intersection of Alpine Blvd, Arnold Way and West Victoria Drive. At the intersection, apparatus would turn north (left) onto West Victoria Drive and follow the road in a northeasterly direction to Victoria Meadows Drive, which will be followed to Victoria Circle and arriving at Country Meadows Road, the main entry point to the the Project.

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**Finding:** *This response route is two (2) miles long. Traveling under non-emergency conditions and obeying all speed limits along the route, the driving time between Station 17 and the entrance to the Project Site is four (4:00) minutes.*

---

**Note:** While roughly paralleling Route # 1, the configuration and right-of-way of Arnold Way adds additional distance between Tavern Road and the three-way intersection in the middle of central downtown Alpine.

**Note:** During the response time evaluation, Arnold Way was subject to a road construction project, with travel lanes impacted by narrowed lanes and traffic lane barricades.

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### **Route # 3**

Fire apparatus would respond from Station 17 and proceed along Tavern Road and through the intersection at Alpine Blvd. in a north-bound direction. North of the Interstate 8 right-of-way corridor, Tavern Road becomes Victoria Park Terrace. Victoria Park Terrace has an approximate sixty (60') foot wide improved paved width and a posted speed limit of 50 m.p.h. Reaching the intersection of West Victoria Drive, apparatus will turn northbound (left) and proceed to the intersection of Victoria Circle.

They will turn east (right) on Victoria Circle, which has an improved paved width of forty (40') feet and travel in a southeasterly direction to Country Meadows Road, the main entry point to the the Project.

---

**Finding:** *This response route is 1.9 miles long. Traveling under non-emergency conditions and obeying all speed limits along the route, the driving time between Station 17 and the entrance to the Project Site is three minutes and forty seconds (3:40).*

**Finding:** *Route # 3 is the most direct route to the Project Site. This route does not pass through the congested traffic conditions of the center-of-town streets and affords minimal response delays.*

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#### **2.1.4 General Emergency Response Findings**

The Alpine Fire Protection District is a member of the Heartland Automatic Aid Agreement and San Diego County Fire Mutual Aid Agreement. The Automatic Aid Agreement supplements Alpine's emergency resources from surrounding career agencies on a closest-engine-basis. Heartland resources responding to wild land fires are assisted by automatic responses from CAL-FIRE and the U.S. Forest Service.

##### **Structure Fire Alarms**

A typical First-Alarm Structure Fire assignment for a fire occurring within the Alpine Fire District would include Alpine Engine 17 (4 personnel), Viejas Engine or Truck 25 (4 personnel, cross-staffing), Lakeside Engine 26 (3 personnel) and Engine 3 (3 personnel), one paramedic unit and one Duty Chief.

Second and Third Alarm assignments will double the First Alarm response for a Second Alarm and triple the First Alarm response for a Third Alarm.

##### **Vegetation Fire Responses**

Three (3) Type I Structure Engines, two (2) Type III Brush Engines, one (1) medic unit  
One Water Tender  
One Battalion/Duty Chief

The Project Site is in State Responsibility Area (SRA).

Alpine FPD vegetation fire response levels reflect a standard Heartland Zone Medium Wildland Dispatch response, with resource levels decreased because of the number of CAL-FIRE fire apparatus and equipment concurrently dispatched to all incidents.

### **CAL-FIRE Vegetation Fire Responses**

Low Wildland – Two (2) Type III engines, one (1) Battalion Chief

Medium Wildland – Four (4) Type III engines, one (1) BC, one (1) bulldozer, two (2) hand crews, two (2) helicopters, one (1) air attack, two (2) air tankers

High Wildland – six (6) Type III engines, one (1) BC, two (2) dozers, four (4) hand crews, three (3) helicopters, one (1) air attack, three (3) air tankers

**NOTE:** These are basic response levels. Response levels are subject to change based on anticipated weather and fire behavior conditions, staffing patterns for unusual events, and State-wide resource commitments.

## **2.2 Emergency Access and Evacuation**

### **2.2.1 Emergency Access**

Primary emergency access to the Project Site is derived from West Victoria Drive, a public road with a south-to-north configuration and an improved paved width of thirty-six (36') feet.



***West Victoria Drive – Country Meadow Intersection, Looking South***

The southern access road to the Project site intersecting with West Victoria Drive is Victoria Meadows Drive. Victoria Meadows Drive is a public street with a west to northeast configuration and an improved paved width of forty (40') feet.



***Victoria Circle at Intersection of West Victoria Drive, Looking East Toward Project Site***

The northern access road to the Project site intersecting with West Victoria Drive is Victoria Circle. Victoria Meadows Drive is a public street with a west to southeast configuration and an improved paved width of forty (40') feet.



*Victoria Meadows Drive, Looking East Toward Project Site*

### **2.2.2 On-Site Road Conditions**

There are no existing paved roads on the proposed Project Site.

Country Meadows Road, extending in a west-to-east configuration from Victoria Circle, will serve as the primary access point to the Project Site. The existing right-of-way for Country Meadows has an improved paved width from curb-to-curb of approximately thirty-six (36') feet. The roadway has an asphaltic concrete all-weather surface and currently serves two existing single family dwellings that are part of the established subdivision west of the Project Site.



***Country Meadows Road at Intersection of Victoria Circle***

As Country Meadows Road extends in a south direction towards the last existing single family dwelling west of the Project site, the improved paved width narrows to sixteen (16') feet and has a maximum grade of 20.7%.





***Existing Southern Terminus of Country Meadows Road, 16' wide***



***Grade at Mid-point, Downhill Section of Driveway***

### **2.2.3 Evacuation Routes**

Future residents will use Country Meadows Road as the primary initial evacuation route from the Project Site.

Turning on Victoria Circle, residents will travel in a southwest direction to Victoria Meadows Drive. At the intersection of Victoria Meadows Drive and West Victoria Drive.

Two directions of travel provided to residents at this intersection for evacuation from the area.

Residents may turn south (left) on West Victoria Drive and proceed toward Alpine Blvd. At Alpine Blvd, two additional directions of travel are provided:

- Residents may turn west (right) and proceed to the intersection of Alpine Blvd and Tavern Road. Residents will have multiple evacuation or shelter options during the travel to Tavern Road and Alpine Blvd or upon turning southbound on Tavern Road.
  - The Alpine Community Center is a designated Evacuation Site for the community and is located approximately one-half-way between West Victoria Drive and Tavern Road on the north side of Alpine Blvd.
  - Turning south bound on Tavern Road, residents may proceed to either Joan McQueen Middle School or Boulder Oaks Elementary School. Both sides are designated Community Emergency Shelters. They are located approximately one (1) mile south of the intersection.
  - Turning north (right) at the intersection, residents can proceed to the Interstate 8 corridor. There are two directions of evacuation travel provided on Interstate 8 – east bound to the Viejas Indian Reservation and west bound towards the community of Lakeside and the Cities of El Cajon, La Mesa and San Diego.
- Residents may travel westerly through the intersection to the intersection of Harbison Canyon Road. At this intersection, there are two directions that can be used as an evacuation route:
  - Turning left (south), residents may proceed to Shadow Hills Elementary School, a designated Primary Emergency Shelter site.
  - Alternatively, residents can continue south on Harbison Canyon Road and proceed through Harbison Canyon to Dehesa Road, where they turn west (right) and proceed several miles to the southeast corner of the City of El Cajon in the Granite Hills area
- Residents may turn east (left) and proceed towards the West Willows and Alpine Blvd intersection. Turning north on West Willows, residents can either enter the east or west bound sides of Interstate 8 for travel out of the community. Alternatively, residents can travel in an easterly direction on West Willows to the Viejas Indian Reservation Gaming Center, which provides large parking lots and buildings for shelter-in-place and potential Safety Zones.

#### **2.2.4 – Shelters and Fire Safe Zones**

**Shelters** - Alpine has four primary shelters and an evacuation site available to the Red Cross.

### **Primary Shelters:**

- Alpine Elementary School, 1850 Alpine Boulevard (RED side-by-side stars)
- Shadow Hills Elementary School, 8770 Harbison Canyon Road
- Joan MacQueen Middle School, 2001 Tavern Road (YELLOW star)
- Boulder Oaks Elementary School, 2320 Tavern Road (ORANGE star)

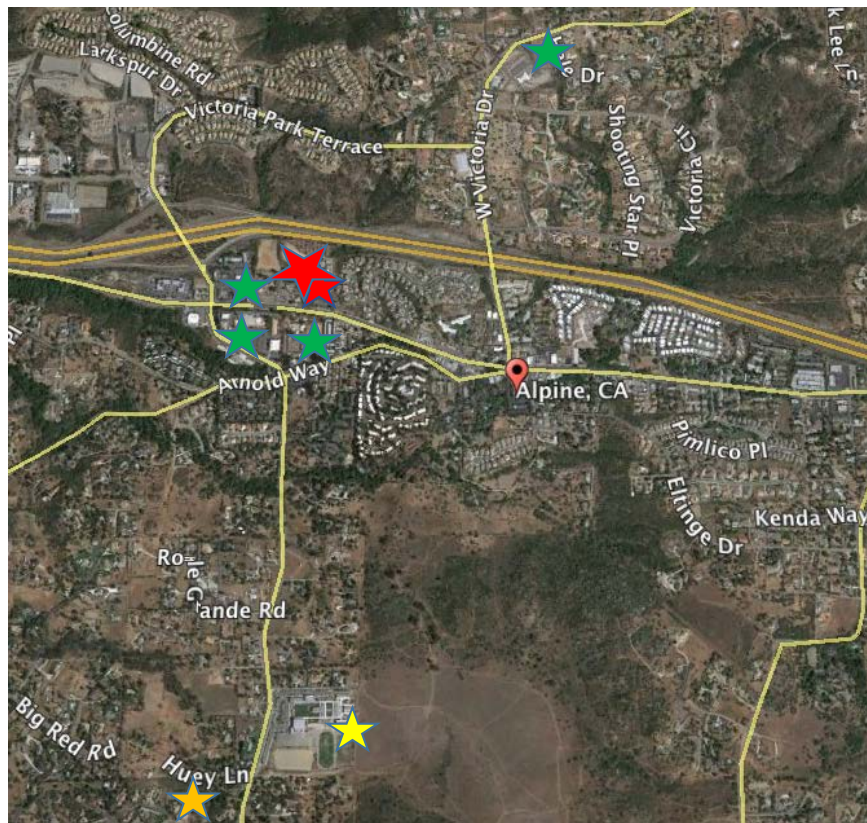
**Evacuation Site** – The Evacuation Site is designated as the Alpine Community Center, located at 1830 Alpine Boulevard (RED side-by-side stars)

### **Fire Safe Zones**

If it is impossible to evacuate from the Alpine area because of traffic congestion on the roads, all of the above locations can serve as Fire Safe Zones. Other potential, but unofficial, Fire Safe Zones are depicted on Figure 2.2.4 as GREEN stars.

### **Emergency Services**

The Red Cross has been contracted to provide emergency services at all of these locations as and when they are needed.



The nearest fire hydrant is at the intersection of Country Meadows Road and Victoria Circle. It is manufactured by Jones and is provided with two 2-1/2" and one 4" discharge ports. In discussions with the Water District, it was determined that the western off-site water distribution systems consists of 10" water mains. The eastern off-site water distribution system has 12" mains.



***Fire Hydrant at the Intersection of Country Meadows Road & Victoria Circle***

Additional fire hydrants are distributed at Code and Ordinance required and Alpine Fire Marshal approved intervals throughout the established sub-division to the west of the Project Site:

- Across from 2538 Victoria Circle, north of the project site
- Victoria Circle and Shooting Star Place, northwest corner
- 2722 Victoria circle, southwest of the Project Site
- Across from 2767 Victoria Circle



- Victoria Meadows Road and Shooting Star Place

All fire hydrants in the established sub-division have two 2-1/2" and one 4" discharge port.

#### **2.4 - Fire Sprinkler Systems**

There are no existing buildings on the Project Site. All new and future buildings will have automatic fire sprinkler systems compliant with NFPA Pamphlet 13-D for residential fire sprinklers in one and two family dwellings installed as required by the most current edition of the Alpine FPD ordinances and San Diego County Consolidated Fire Code.

#### **2.5 - Ignition Resistant Construction**

There are no existing buildings or structures on the proposed Project Site.

All new and future buildings and structures will be required to conform to Chapter 7-A of the County of San Diego Building Code for Ignition Resistant Building Construction Standards for Wildland-Urban Interface Areas.

#### **2.6 Defensible Space, Ornamental Landscaping and Vegetation Management**

There are no existing structures and buildings on the proposed Project Site.

Defensible Space, Vegetation Management and Ornamental Landscaping are regulated by provisions found in the County of San Diego Consolidated Fire Code, California Fire Code, International Wildland Urban Interface Code, California Public Resources Code, California Health and Safety Code and the California Government Code. Buildings and structures erected in brush covered lands are generally required to have defensible space and fuel modification zones measuring 100 feet in depth.

All regulatory provisions contain exception clauses allowing diminished defensible space depth when sufficient clearance cannot be accomplished because of parcel constraints and restrictions. In such cases, defensible space is provided as "Zone 1" (removal of all native vegetation with replacement consisting of fire- and/or drought-resistant species and "approved", irrigated landscaping) fuel modification zones that extend to established property lines.



Recent revisions to State legislation limits extension of the maximum 100-foot-deep defensible space zones on properties in extra hazardous locations. It is only allowed following a site evaluation by CAL-FIRE (or Local Fire Authority Fire) Prevention personnel and after a written justification has been produced. Property owners cannot be required to provide off-site fuel modification zones and defensible space beyond their property lines.

## **CHAPTER 3**

### **ANTICIPATED FIRE BEHAVIOR IN THE VICINITY**

#### **3.1 Fire Behavior Model**

##### **3.1.1 Summary Narrative**

Anticipated Fire Behavior was analyzed after visiting the Project and identifying the on- and off-site natural vegetative fuels. Terrain and topographical inputs were determined by site visits and making comparisons with two- and three-dimensional maps. Weather inputs were derived from the Interior Zone Worst Case Weather and Burning Conditions table supplied by the County of San Diego Guidelines for Fire Protection Plans and by 2003 Cedar Fire weather and fuel parameters, which were previously established as worst-case fire behavior conditions in San Diego County.

The above data inputs were subjected to analysis by the BEHAVE-Plus 5.0.5 Wildland Fire Modeling program to determine potential wild fire behavior at the Project Site.

The BEHAVE-Plus Fire Behavior Prediction and Fuel Modeling System is a computer-based systematic method of predicting wild land fire behavior. It was developed by the U.S. Forest Service at the Intermountain Forest Fire Laboratory, Missoula, Montana, and is used by wild land fire experts and scientists nationwide. BEHAVE-Plus is designed to predict fire spread and describes fire behavior only at the flame front of a fire. The primary parameter of the BEHAVE fire behavior calculations are dead fuels less than one-quarter (1/4") inch in diameter that readily carry fire across the landscape. Fuels larger than three (3) inches in diameter are not included in the BEHAVE calculations. The BEHAVE fire model describes a wildfire spreading through surface fuels, which are the burnable materials within six (6) feet of the ground and contiguous to the ground.

##### **3.1.2 Use of Fire Model Inputs – Caveat**

The BEHAVE-Plus Fire Behavior Model is a tool used by fire authorities to estimate the behavior of fire moving towards a structure under certain assumptions. The Fire

Behavior Model is only an estimate and is not designed to replace the experience of the local Fire Authority, who is familiar with local wildfire behavior. The Behave-Plus fire model is not the only recognized fire model that is available; it is identified in this report only because it is the model currently used by most fire consultants.

**3.2 Anticipated Fire Behavior**

Evaluation of anticipated fire behavior on the Project site used historical data, analysis of significant wind events and identifying the different fuel models present in the area. The strongest winds likely to impact the Project are from the east/northeast during Santana wind events. The Project site has steep south-facing slopes intersected by three major drainages. Two of the drainages have a northeast to southwest configuration and are in direct alignment with topography and vegetative fuels that will be influenced by a strong northeast wind conditions, with significant impacts on fire spread and behavior.

The normal south and southwest winds typically associated with the area are occasionally strong and gusty. The northeast to southwest major drainages are in direct alignment with vegetative fuels and topography that will be influenced by southwesterly winds with moderate to significant impacts on fire spread and behavior. However, these normal winds are generally associated with cooler, moist air and usually have higher relative humidities of 40% or more. They are considered a serious wildfire weather condition when wind speeds are over 20-MPH and relative humidity is 30% or lower.

The Project is currently covered by vegetation typical of Fuel Models TU-5 (oak woodland with grass understory) in the southern riparian drainages and Fuel Model SH-5 Heavy Load, Dry Dclimate southern mixed chaparral and shrubs and SH-7 Very Heavy Load Dry Climate Shrub on the remainder of the Site.

The chaparral and shrub fuels consistent with Fuel Model SH-5 are, according to BEHAVE computer fire modeling, the most severe fire behavior conditions measured for the Project Site.

For the overall analysis of fire behavior, all fire scenarios will use fuel models SH-5 to predict fire behavior under various conditions and locations on the Project Site.

**3.2.1 Fire Behavior Threat Analysis**

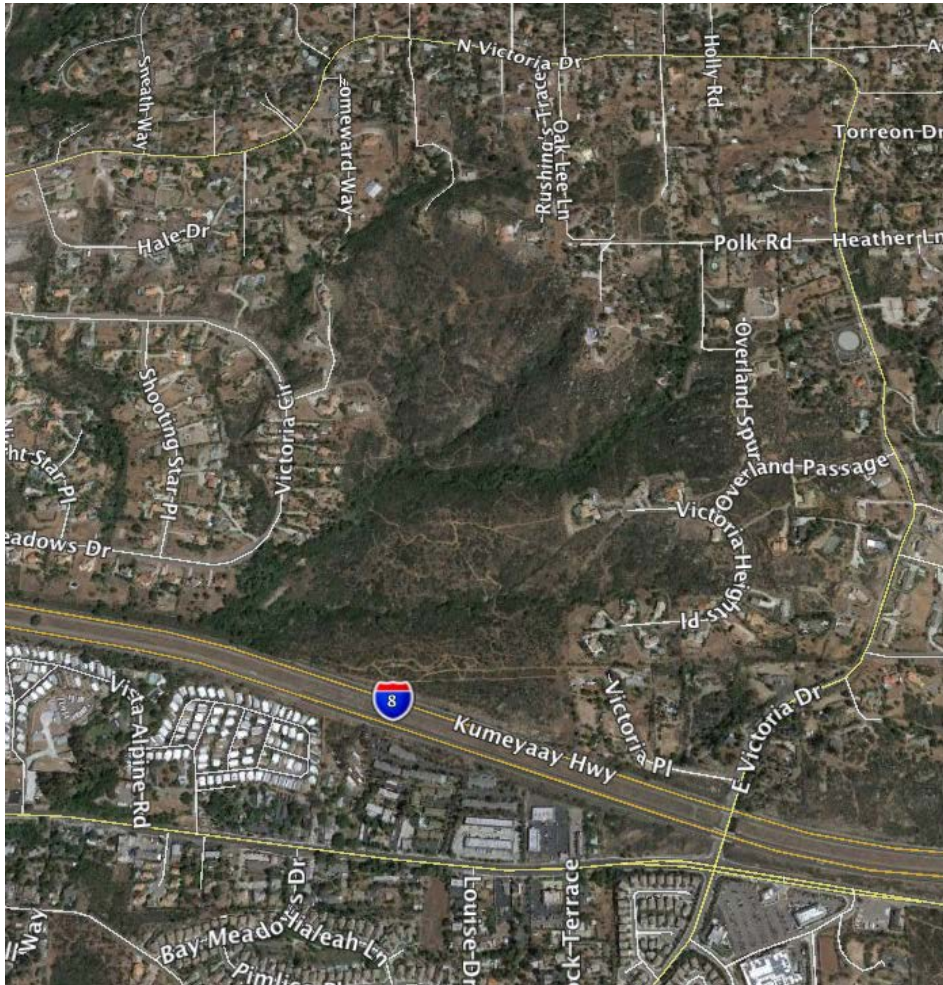
An evaluation of the Project Site was has determined that it will be exposed to the following foreseeable wild fire threats as listed below. The predicted fire behavior is the worst-case scenario anticipated for the environmental and weather parameters of the Project site.

Location	Flame Length	Rate of Spread	Spotting
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Northeast Drainage	41 feet	488 ft./min.	1.6 miles, 100%
Center Drainage	40.9 feet	485 ft./min.	1.6 miles, 100%
Southeast Drainage	40.9 feet	485 ft./minute	1.6 miles, 100%
Southern "Bowl"	40.7 feet	481 ft./minute	1.6 miles 100%

**Table 3.2.1 - Worst Case Fuel Model SH-5 Predicted Fire Behavior**

The fire behavior analysis scenarios listed below are for existing, pre-Project completion conditions only. Development of the Project Site will change anticipated fire behavior and will be addressed in Section 4.7.1.1.

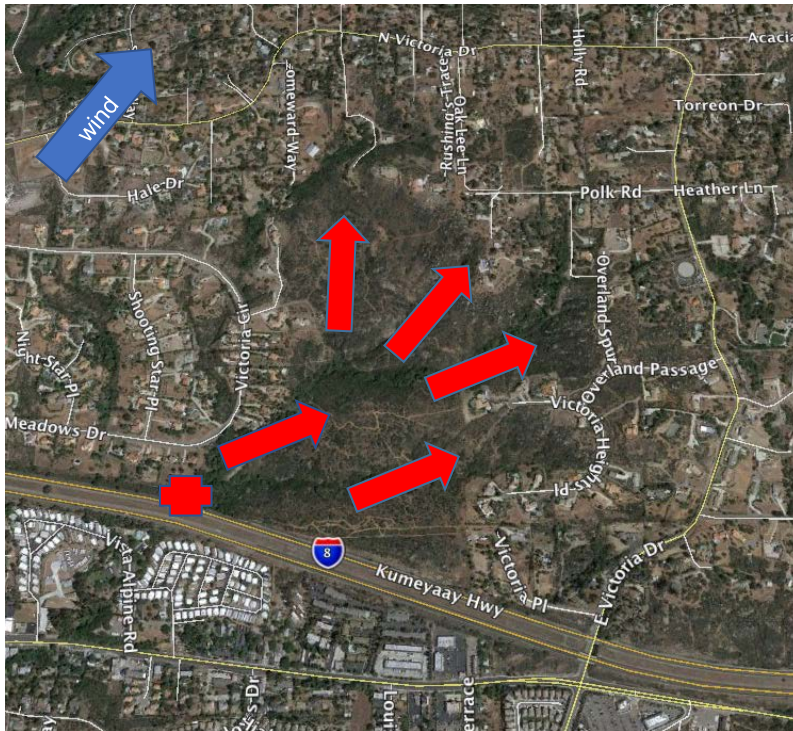


**Figure 3.2.1 - Overview of Project Site Depicting Topographic Features**

### **3.2.1.1 Fires Originating Along the I-8 Corridor, Late Afternoon, Summer Southwest Winds**

The normal summer late afternoon south and southwest winds found in the area are occasionally strong and gusty. These winds tend to be cooler, have relatively moist air and usually have higher relative humidities of 40% or more. They are considered a serious wildfire weather condition when wind speeds are over 20-MPH and relative humidity is 30% or lower.

For purposes of fire behavior analysis, for worst-case situation, that a fire will start near the southeast corner of the Project Site and immediately adjacent to the Interstate 8 right-of-way corridor (indicated by RED cross).



***Anticipated Fire Behavior for Fires Starting Along I-8 During Typical Summer Afternoon Periods***

Fires starting at the southwest corner of the Project site in the area of the riparian creek bed and the topographic bowl depression will be influenced by the late afternoon southwest winds typical to this area during summer months. The winds will primarily push the fire in a southwest to northeast direction, away from the houses along Victoria



Meadows Drive and Victoria Circle but toward the residential developments west of East Victoria Drive on the east side of the Project Site. There are three natural drainages with southwest to northeast configurations, covered by heavily native and non-native vegetative fuels, that are in direct alignment with the prevailing winds.

When the fire front reaches the base of the mountain side, fire behavior may change significantly. Under continuing upslope wind influences, the Rate of Spread will increase, driving the fire both up- and cross-slope into previously unburned fuels on the mountainside. However, the general fire behavior at the base of the mountain, although moving with rapid rates of spread, will tend to have slower spread rates than on the slopes and canyons as it moves across the landscape through unmanaged vegetation toward the East Victoria Drive area.

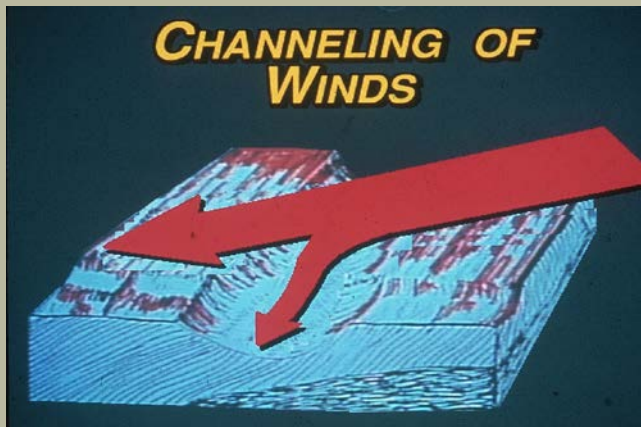
Fire entering the southwest to northeast configured drainages will generally progress in a northerly direction toward the houses on East Victoria Drive. As fire enters the wind and topography aligned canyons, it will be rapidly drawn through the topographical features toward the ridge lines to the east. Rate of Spread will accelerate in the topographical draw as the wind in the narrow canyon is channeled upward, with a major flame front developing and making a run towards the homes to the north and east.

Fire behavior may become unpredictable because of gusty winds; erratic winds; wind eddies on ridgelines; long-range spotting with firebrands deposited in receptive vegetation downwind for distances over two miles; and rapid fire extension upslope in natural chimneys.

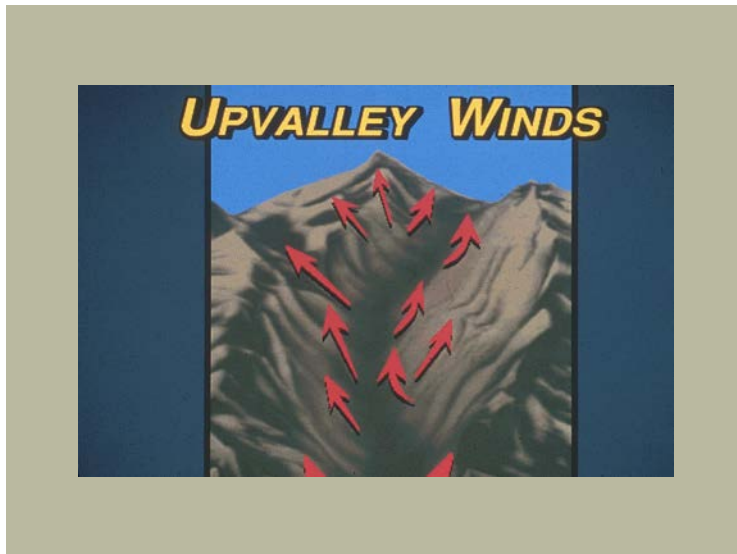
Natural topographic features associated with the development of fire whirls are present along the mountainside, natural drainages, and prominent peaks. Unstable, erratic winds, in combination with topographical outcroppings and unevenly heated ground, could trigger fire whirls, resulting in unpredictable rates of spread and intensity. Fire behavior at the bottom of the slope will be impacted by the erratic fire behavior developing upslope

The flame front can be expected to follow the base of the mountain under the influence of the southwest winds, with rapid rates of spread. The flame front will create potential direct flame contact, convective and radiant heat exposures to all buildings and structures along the path of its spread across the landscape. Firebrands lofted by convective will land in the vegetation island between homes east and northeast of the Project Site and in unmanaged vegetation fuel beds east of East Victoria Drive.





Diagrams Showing Typical Channeling of Winds  
Through Canyons



#### **3.2.1.2 Fires Originating from East Victoria Drive, Northeast/Santa Ana Wind Event**

For purposes of fire behavior analysis, for worst-case situation, a fire will start off-site on the southwest facing slope of Viejas Mountain, east of East Victoria Drive (indicated by RED cross).



Santa Ana Northeast winds, with velocities of 30 mph, or more, will influence the fire's head (leading edge of the flame front) and drive the fire across the landscape in a southwesterly direction with a high rate of flame spread. Rate of spread, based on wind speed, topography and vegetative fuel types is anticipated to be 485 feet per minute. The flame front will move through existing developed residential areas before reaching the Project site. It is foreseeable that one, if not several residential buildings, depending on building construction, fire intensity and condition of fuel modification zones (defensible space) around buildings, will ignite with the flame front passage.

After moving through the developed off-site housing sites, the flame front will enter fuel bed running parallel and below the Project site's eastern slope and west of East Victoria

Drive. Natural vegetation in this area are heavy chaparral fuel types, with heavy canopy loading and unbroken continuity and compactness. Fuel height varies between six (6') and three and approximately fifteen (15') feet, with the average being nine (9') feet.

The vegetation in this area can be described as Fuel Model SH-5, High Load Dry Climate Shrub, or SH-7, Very High Load Dry Climate Shrub. Worst-Case Fires in this fuel bed will produce flame lengths of approximately forty-one (41') feet, will progress across the landscape at an average rate of 485 feet per minute and will loft fire brands 1.6 miles with 100% ignition in downwind receptive fuel beds.

Under the influence of northeast Santa Ana winds, the flame front will progress rapidly cross-slope and downslope in a southwesterly direction.

Fire behavior may be unpredictable due to gusty winds; erratic winds; wind eddies on ridgelines; long-range spotting with firebrands deposited in receptive vegetation downwind for distances over two miles; and rapid fire extension downslope into natural chimneys. Natural topographic features associated with the development of fire whirls are present along the prominent ridge lines and natural drainages with prominent peaks.

The flame front can be expected to follow the hillside slopes and drainage under the influence of the northeast winds, with rapid rates of spread. The flame front will create potential direct flame contact, convective and radiant heat exposures to all buildings and structures along the path of its spread across the landscape. Firebrands lofted by convective will land in the vegetation island between homes within the Alpine 21 and Victoria Meadows developments, in the Open Space Easements within the Project Site, and into established developed areas south of the Interstate 8 right-of-way corridor, igniting receptive and unmanaged vegetation, and potentially, non-fire resistive buildings and structures.

### **3.2.1.3 Fires Originating from Victoria Circle**

For purposes of fire behavior analysis, for worst-case situation, a fire will start off-site in the backyard northeast of the Project Site on Victoria Circle (indicated by RED cross).

Strong prevailing late afternoon winds from the southwest can pose a threat to the Project Site. These winds will direct a fire front through the unmanaged vegetative fuels (Fuel Model SH-5) on the mountainside.

In this scenario, predicted flame lengths with a 30 MPH southwest wind has predicted flame lengths of approximately forty-one (41') feet. Fire behavior will progress cross- and up-slope corresponding to daily convective wind patterns resulting from solar radiation and increases in atmospheric temperatures.





When the fire front reaches the mountain slope behind the residential yard of origin, fire behavior may change significantly. Under continuing upslope wind influences, the Rate of Spread will increase, driving the fire both up- and cross-slope into unburned fuels on the mountainside.

Unstable, erratic winds, in combination with topographical outcroppings and unevenly heated ground, could trigger fire whirls, resulting in unpredictable rates of spread and intensity.

Under the influence of southwest winds, the flame front will progress rapidly cross-slope in northeasterly and easterly directions. Fire behavior may be unpredictable due to gusty winds; erratic winds; wind eddies on ridgelines; long-range spotting with firebrands deposited in receptive vegetation downwind for distances over two miles; and rapid fire extension upslope in natural chimneys.

The flame front can be expected to follow the base of the mountain under the influence of the southwest winds, with rapid rates of spread. The flame front will create potential direct flame contact, convective and radiant heat exposures to all buildings and structures along the path of its spread across the landscape, especially on the ridgelines on which the homes accessed from East Victoria Drive have been built. Firebrands lofted by convection will land in the vegetation islands between homes, igniting receptive and unmanaged vegetation.

This FPP will prescribe implementation of the current Fire Code requirements that should mitigate fire risks from either a 60-mph northeast Santa Ana wind or any prevailing 30-mph southwest or south wind.

All Project residential buildings will be built to the Ignition Resistant Building Material Standards specified in Chapter 7-A of the California Building Code, the San Diego County - Consolidated Fire Code, and County of San Diego Building Code.

## **CHAPTER 4**

### **ANALYSIS OF PROJECT EFFECTS**

#### **4.1 Adequate Emergency Services**

##### **4.1.1 – Fire Authority Having Jurisdiction**

The Alpine Fire Protection District provides year-round (24-7-365) public safety services, including fire protection, emergency response, medical aid, fire prevention, disaster preparedness, search and rescue and community education programs.

The Department operates one fire station and is responsible covering a response area of 27.5 square mile area.



The Department has been evaluated by the Insurance Services Office and received a Fire Suppression rating of “2/2Y” on a “1 to 10” scale, with “1” being the most effective fire services and “10” the least effective.

The Fire Department dispatches three Type I (Structure) Engine Companies, One Truck (ladder) Company and a Command and Control Chief Officer to all first alarm structure fire responses. The First Alarm assignment for Vegetation Fires is three Type III (Brush) Engines. Alpine FPD is a participant in the Central (Heartland) Zone Automatic Aid Agreement, which dispatches on a “Boundary Drop” basis where the closest engine to a reported emergency responds without consideration given to jurisdictional boundaries.

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**Finding:** *The standard First Alarm Structure response provided by the Alpine Fire Protection District is commensurate to dispatch levels and personnel assignments for other career Fire Departments in San Diego County.*

**Finding:** *A minimum of twelve (12) firefighters (four companies with a minimum staffing of three firefighters) respond with a Command and Control officer to all incidents. This fire assignment provides one engine company for interior fire attack operations, one engine company for RIC (Rapid Intervention Crew for firefighters is distress rescue operations), one engine company to support interior fire attack operations and one company to provide ventilation, search and rescue functions, forcible entry and utility securement tasks.*

**Finding:** *The Alpine Fire Department First Alarm assignments provide an effective initial attack firefighting force.*

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#### **4.1.2 – Response Time and Nearest Fire Station**

The Response Policy of the Alpine Fire Protection District is to have resources arrive at fire and other emergency incidents within five (5) minutes of initial dispatch 80% of the time.

The County of San Diego’s General Plan Emergency Response Time criteria for semi-rural single family residential parcels is five (5) minutes.

Fire Station 17, the closest Fire Station to the Project Site, is approximately 1.78 miles from the Project Site and the estimated travel time under normal, non-emergency driving conditions is under five (5) minutes.

Fire Station 25, the next closest fire station to the project site, is approximately four (4) miles from the Project site and the estimated travel time under normal, non-emergency driving conditions is eight (8) minutes.

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***Finding*** – *The primary fire apparatus resources for the Project, under normal, non-emergency driving conditions, will be able to travel to the Project Site within the County's General Plan Emergency Response Time criteria.*

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## **4.2 Fire Access**

### **4.2.1 - Access to Project Site**

The Project Site currently has two major ingress and egress routes.

The southern route is over Victoria Meadows Drive and Victoria Circle, which have a forty (40') foot improved paved width all weather road surface. Victoria Meadows begins at the intersection of West Victoria Drive and continues in an easterly direction to an imaginary intersection with Victoria Circle, slightly east of Shooting Star Place.

The northern route is over Victoria Circle, which begins at its intersection of West Victoria Drive and continues to the east, curving to the southwest to its imaginary intersection with Victoria Meadows Drive. Victoria Circle has an all-weather paved surface with an improved width of forty (40') feet.

Immediate access to the Project Site is on Country Meadows Road. Country Meadows Road begins at its intersection with Victoria Circle and continues to the east. It has an initial paved width of thirty-two (32') feet, with narrows to a private driveway that curves to the southeast with an improved paved width of sixteen (16') feet.

### **4.2.2 – Current Road Conditions**

The southern ingress and egress route on Victoria Meadows and Victoria Circle (an extension of Victoria Meadows Drive at its eastern end) is paved with an asphaltic concrete (asphalt, macadam) paved surface. The paving surface appears to be in fair to good condition, exhibiting moderate amounts of weathering but with no obvious potholes or repairs. The development west of the Alpine 21 Project Site is not a gated community; there are no obstructions, traffic calming devices or chokepoints along the lengths of either Victoria Meadows Drive or Victoria Circle.

The northern ingress and egress route on Victoria Circle is paved with an asphaltic concrete (asphalt, macadam) paved surface. The paving surface appears to be in fair to good condition, exhibiting moderate amounts of weathering but with no obvious potholes or repairs. The development west of the Alpine 21 Project Site is not a gated community; there are no obstructions, traffic calming devices or chokepoints along the lengths of Victoria Circle.

Country Meadows Road is paved with an asphaltic concrete (asphalt, macadam) paved surface. The paving surface appears to be good condition. The sixteen (16') foot private driveway slope of 20.7% exceeds the current maximum grade permitted by the San Diego County Consolidated Fire Code.

#### **4.2.3 – Proposed Access Roads**

There are three (3) proposed streets that will serve the Project Site for egress and ingress purposes:

- Country Meadows Road
- Christina Leigh Way
- Christina Country Court

Country Meadows Road is the primary access road for the Project Site. It has a west-to-east configuration, beginning at the intersection of Country Meadows Road and Victoria Circle. This street will have an improved paved width of thirty-two (32') feet and will terminate in a cul-de-sac bulb near the northeast corner of the development. The maximum proposed grade is 17%, which starts at the east side of Lot # 1 and continues to the eastern terminal cul-de-sac bulb.

Christina Leigh Way begins at its intersection with Country Meadows Road near the northwest side of the Project and slightly east of the western property line for the development. Christina Leigh Way has a primary north to south configuration; at its southern end, it intersects with Christina Country Court. The street crosses through the southern Open Space Easement Area. It has an improved paved width of thirty-two (32') feet. The maximum proposed grade is 20%, which is located between the intersection with Country Meadows Road and ends slightly north of the Open Space "B" and "C".

Christina Country Court is located at the southern end of Christina Leigh Way at a tee intersection. Christina Country Court splits off from Christina Leigh Way in two directions, the western portion having an east to west configuration and the eastern portion having a west to east configuration. Both portions of this street have an improved paved width of thirty-two (32') feet. Parcels 12 through 20 are accessed from Christina Country Court.

#### **4.2.4-- On-Going Road Maintenance**

The project developer has three options for funding private road maintenance:

1. California Civil Code Section 845 – requires that the owner(s) of a private road easement to maintain the road in good repair through formal agreements or proportional sharing of costs incurred. Enforcement of the in perpetuity road maintenance operations is by legal action in a court of law having jurisdiction over the right-of-way or by judgment of an impartial arbitrator. The judgment may be enforced as a money judgment by any party against any other party to the legal action taken.
2. County of San Diego Private Road Maintenance Agreement - as authorized by Section 21065 of the California Public Resources Code and Sections 81.402(c)(1) and 81.703(c)(1) of the County of San Diego Code of Regulatory Ordinances, the developer, individual lot owners and the County may enter into private road maintenance agreements. This type of agreement binds current and future lot owners to provide equal and proportional sharing of road maintenance costs that include, but are not limited to, the following operations - reasonable and normal road improvement and maintenance work to adequately maintain said private road easement and related drainage facilities to permit all weather access, filling of chuck holes, repairing cracks, repairing and resurfacing of roadbeds, repairing and maintaining drainage structures, removing debris, maintaining signs, markers, striping and lighting, if any, and other work reasonably necessary or proper to repair and preserve the easement for all weather road purposes.
3. Creation of a Permanent Road Division – A Permanent Road Division zone is a special district established at the request of property owners with a common road related need in a specific area for repairs and maintenance. Property owners must pay all of the costs of the PRD through a special benefit assessment or parcel charge assessment on their property tax bill. The cost to each individual property owner is determined by the benefit their property receives as a result of road repair and maintenance.

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***Finding:*** *The Alpine Fire Marshal has conditioned the Project to provide an in perpetuity Private Road Maintenance agreement with the County of San Diego.*

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### **4.3 Water Supply**

#### **4.3.1 – Existing Water Distribution System**

The project site is served by the Padre Dam Municipal Water District.

The Developer has applied to Padre Dam MWD for a “Project Facility Availability Form” (“Will Serve” letter) for the Project. The Project Facility Availability Form states that the existing or proposed water infrastructure can support the Project. (***See Attachment G***). The required fire flow in a water main is 2500 gallons per minute for new sub-divisions.

#### **4.4 Ignition Resistant Construction and Fire Protection Systems**

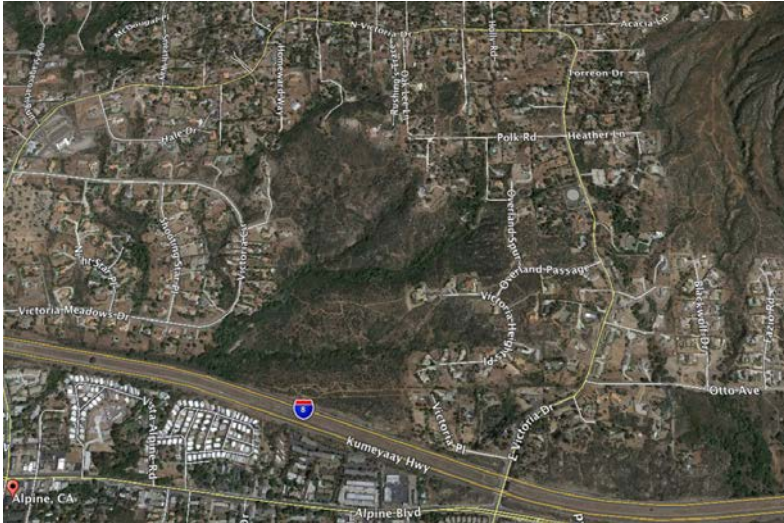
##### **4.4.1.1 – Existing Structures on Project Site**

There are no buildings or structures on the proposed Project Site.

All new and future buildings and structures will be required to conform to Chapter 7-A of the County of San Diego Building Code for Ignition Resistant Building Construction Standards for Wildland-Urban Interface Areas. Automatic fire sprinkler systems conforming to NFPA Standard 13-D for residential fire sprinklers in one and two family dwellings shall be installed for all buildings and auxiliary structures designated by the most current Alpine FPD local ordinances and the San Diego County Consolidated Fire Code.

##### **4.4.1.2 – Existing Off-Site Structures**

Off-site, the community around the project is zoned for, and developed as, residential occupancies. Single Family Residences surround the Project Site on three (3) sides, with the Interstate 8 right-of-way corridor serving as the fourth side.



***Existing Development Around the Project Site***

Site visits to the area in conjunction with analysis of the Project Site indicates that most of the off-site single family dwellings have been built in compliance with former County of San Diego Enhanced Fire Resistant Construction and current California Building Code Chapter 7-A requirements for Wildland Urban Interface (WUI) Areas.

Approved Fire Resistant Construction features include, but are not limited to:

- Installation of NFPA Standard 13-D Residential Fire Sprinklers
- Class A Non-combustible Roofs
- Boxed and enclosed Roof Eaves
- Fire resistant or non-combustible wall siding
- Dual pane fire resistant or tempered glass windows

**4.5 Fuel Modification Zones- Defensible Space**

Site visits to the area in conjunction with analysis of the Project Site indicate that the existing residences in the area have varying degrees of Fuel Modification Zone and Defensible Space compliance. It is estimated that 50% of the homes in the area have inadequate defensible space maintenance, as evidenced by combustible native and non-native vegetation allowed to grow unmanaged, in some cases, within ten (10') of buildings. In many cases, fuel canopies within defensible spaces have not been thinned by 50% of their growth and dead and dying fuels have not been removed.





***Typical Fuel Modification Conditions Throughout the Adjacent Residential Developments***

The Project Developer is not responsible for the lack of off-site Fuel Modification Zone compliance. This is the individual property owner's responsibility.

However, the Project Site, when completed according to the prescriptive treatments of this Fire Protection Plan, will mitigate large areas of formerly unmanaged vegetative fuels that currently expose off-site buildings and properties to hazardous conditions.

## **4.6 Fire Fuel Assessment**

### **4.6.1 General Description of On-Site Vegetative Fuels**

The site visits revealed that the primary vegetation on the Project Site is native species of Mixed Southern Chaparral intermixed with shrubs with riparian growth trees. These fuel type covers the undisturbed habitat and proposed developed areas of the site.

In addition to the Biological Resources Map, the site visit determined that the native vegetative fuels on the site can be classified as SH-5, Heavy Load Dry Climate Shrub and

SH-7, Very High Load, Dry Climate Shrub according to the most current edition of *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model*.

### **Shrub Fuel Type Models (SH)**

The primary carrier of fire in the SH fuel models is live and dead shrub twigs and foliage, in combination with dead and down shrub litter. A small amount of herbaceous fuel may be present, especially in SH1 and SH9, which are dynamic models (their live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content). The effect of live herbaceous moisture content on spread rate and flame length can be strong in those dynamic SH models.

Two SH type vegetative fuels were identified off-site from the Project area:

- SH-5, Heavy Load, Dry Climate Shrub
- SH-7, Very Heavy Load, Dry Climate Shrub

### **SH-5 Heavy Load, Dry Climate Shrub**



*Typical SH-5 Heavy Load Dry Climate Shrub Growth on Project Site*

The primary carrier of fire in SH-5 is woody shrubs and shrub litter. SH-5 has a moderate fuel load and fuel depth of about one to two feet. The rate of spread is low and flame lengths are low. Typical fuel loading is 5.2 tons per acre and the extinction moisture content is 15%.

**SH-7, Very Heavy Load, Dry Climate Shrub**



***Typical SH-7 Very Heavy Load Dry Climate Shrub Growth on Project Site***

The primary carrier of fire in SH7 is woody shrubs and shrub litter. The vegetative fuel has very heavy shrub loading, with a depth of four (4 to 6') to six feet. The Rate of Spread, while considered high, is lower than SH-5 fuels, but the flame lengths are similar and usually very high. Fuel loading is 6.9 tons per acre and the extinction moisture content is low at 15%.

#### **4.6.2 Fire Behavior of Identified Vegetative Fuels**

A detailed discussion of the fire behavior for vegetative fuels on the Project Site is discussed in Section 3.2 (above).

#### **4.6.3 Fire Behavior Threat Analysis**

A detailed discussion of the Fire Behavior Threat Analysis for vegetative fuels on the Project Site is discussed in Section 3.2 (above).

### **4.7 Fire Behavior Modeling**

#### **4.7.1 Fire Behavior Modeling Summary**

Wildland fire behavior calculations have been projected for the hazardous vegetative fuels on the undeveloped adjacent sites bordering the project and inside the proposed

residential development. These projections are based on “worst case” fire scenarios that could impact the project site.

The computer based BEHAVE-Plus Version 5.0.5 was used to develop the fire behavior assessments impacting the project. The BEHAVE Fire Behavior Calculations display the expected Rate of Fire Spread (expressed in feet per minute), Fire Line Intensity (Btu/ft./sec), and Flame Length (feet) for two (2) different fuel models (SH-5, Heavy Load, Dry Climate Shrub, and SH-7, Very High Load Dry Climate Shrub) of native fuels during peak Santa Ana wind conditions expected in the Project's climate zone. Variables were slope, projected wind speed, and the anticipated weather. The tables also include the calculation inputs used in the Modeling System obtained from project site observations and fuel levels typically observed during the local fire season.

#### **4.7.1.1 Projected Fire Behavior**

***Anticipated Fire Behavior – Treated Project Site*** -The combination of required defensible space around structures and enhanced fire resistive building code requirements for the project site will remove and/or modify the existing highly flammable natural vegetation, creating an entirely different fuel model most resembling Urban Development (NB-1) or Agricultural Land (NB-3).

Fuel Model NB-1 includes lands covered with suburban development that will not support wild fire spread but may experience structural fire losses during vegetation fire incidents. Building ignitions usually occur from house to house exposures or from firebrands, neither of which are modeled by current Fuel Model parameters.

The fuel model sets currently used by fire scientists, fire behavior analysts and Fire Protection Plan consultants do not have the ability to simulate fire behavior changes created by various fuel treatments. Fuel Models are based on fully cured vegetation at or near their seasonal extinction moistures and, concurrently, at the worst part of the annual fire season. This tends to produce over-prediction of fire spread rates and other fire behavior parameters, especially in annual grass fuels.

The Fuel Model parameters used by BEHAVE-Plus for grass fuels expresses an extinction moisture content level of 15% for annual grasses and assumes a potential heat release rate of approximately 8000 BTUs per pound of fuel present on the landscape, whether the fuel is in a “live” or “dead” condition.

Irrigated lawns, as proposed as part of the defensible space guidelines for the project, will have a fuel moisture content of at least 120%. Fuel moisture contents of 120% result in green, non-cured vegetation, with all herbaceous materials remaining in the “live” fuel categories. As a result, grassy fuels with high fuel moisture content will produce flame lengths of one (1') or less and have a rate of spread of approximately 5 chains (330 feet) per hour (5.5 feet per minute) when exposed to a 20 m.p.h. mid-flame wind.

### ***Anticipated Fire Behavior, Untreated Open Space Easements On Project Site***

The proposed Open Space Easements on the Project Site creates large areas of unmanaged flammable vegetation surrounding the parcels developed for single family dwellings. This creates a classic Wildland Urban Interface area where lands with “higher levels of housing density” are grouped together and are immediately adjacent to, or surrounded by, lands covered by heavy natural vegetation. This is compared to the WUI Intermix where there is more than one house every forty (40) acres where wildland fuels dominate the landscape.

The County of San Diego Resource Protection Ordinance places special controls on development on lands adjacent to sensitive biological habitats, steep slopes, wetlands and floodplain areas. The RPO does not allow clearing, thinning or grubbing of natural vegetation for fire protection purposes in sensitive habitat lands and riparian or wetland areas.

The Memorandum of Understanding between the U.S. Fish & Wildlife Service, California Department of Fish & Game and the San Diego County Fire Agencies requires landowners and fire agencies to avoid vegetation removal in recognized riparian areas, such as the drainages and geographical bowl on the south side of the Project site.

Thus, natural vegetation within the Open Space Tracts will remain unmanaged. With time, the age of the mature vegetative fuels continues unabated, with commensurate increases of dead and dying materials in the vegetative canopies, leading to decadent fuels with explosive combustibility.

The Fire Behavior Characteristics for the unmanaged vegetative fuels in the Open Space Tracts will remain consistent with those identified in Section 3.2.1.

The BEHAVE modeled fire behavior is worst-case scenario during peak Santana-Northeast wind weather events for Fuel Model SH-5 Heavy Dry Climate Shrub vegetation. Field evaluation indicates that Fuel Model SH-7 Very Heavy Dry Climate Shrub vegetation is present at the Project Site; FM SH-5, however produces more extreme combustibility than SH-7. The Rate of Spread for SH-7, while considered high, is lower than SH-5 fuels, but the flame lengths are similar and usually very high. The differences in rate of spread and combustibility are a result of fuels with contiguous and compacted continuity and heavier canopies where foliage does not allow free circulation of air through the vegetative mass, thus retarding combustibility.

Shrub-type fuels in the Open Space Tracts will produce the following fire behavior characteristics:

- Flame lengths between forty (40) and forty-two (42) feet
- Rate of spread – between 481 and 486 feet per minute
- Ignition through firebrand deposition – 100% at a down-wind range of 1.6 miles
- Flame heights of approximately sixty-seven (67') feet.



Flame lengths and flame height, while seeming synonymous with each other, should not be confused with each other.

Flame length is a measurement of the depth of the fire front as it moves across the landscape through combustible vegetative fuels.

Flame height is a measurement of the thermo-chemical reaction of the fire as it consumes available fuel. Flame height depends on the amount fuel available and the amount of air being entrained into the sides of the flame front. Entrainment is the mixing of ambient air into the combustion zone by turbulent eddies, which is most notable in the random fluctuation and varying dimensions of the flame front typical of wild fire combustion. In turbulent flames, the combustion height does not have a constant or stationary value.

BEHAVE fire modeling calculations are based on fuel beds with continuous depth and compactness. As the flame front moves out of the unmanaged Open Space tract vegetation into the fuel modified defensible space, the fuel beds changed, with less flammable materials available for combustion.

As exhibited in Sections 6.1.4 and 6.1.5, fires moving out of the Open Space Tracts into developed residential areas will have a subsequent decrease in combustion with the changes in fuel types and continuity.

With less available fuel, the thermo-chemical reaction diminishes, with corresponding drops in Heat Release Rates, turbulent flame heights and the depth of the flame front moving across the landscape. The smaller Heat Release Rate also lowers the radiation and convective heat transfer mechanisms, limiting exposure of buildings separated from fuel beds by the distance provided by defensible space. The design of the fuel modification zones and required defensible space, also limits open flame intrusion into the developed residential areas.

## **4.8 Defensible Space and Vegetation Management**

### **4.8.1 Flammable Vegetation**

### **Fuel Modification Zone # 1**

With minimal exceptions, all combustible natural vegetation shall be removed from FMZ Zone 1, the first fifty (50') feet of land surrounding the building envelope for each parcel. Exceptions include single specimens of vegetation that is maintained in perpetuity and which does not allow flame propagation along the landscape.

See Section 4.8.2 for details.

### **Fuel Modification Zone 2**

In FMZ 2, extending between fifty (50') and one-hundred (100') feet from each building envelope, the canopies of combustible vegetation are thinned by 50%, through thinning and/or removal of live and dead and dying vegetative materials. This area of thinned vegetation is to be maintained in perpetuity.

See Section 4.8.2 for details.

### **4.8.2 Fuel Modification Zones for Building Pads**

Fuel Modification Zones are specific areas on a property where vegetation has been removed, planted with alternative landscaping or modified in ways that increase the likelihood that a structure will survive a wildfire, improve defensible space around the structure for firefighting activities and prevent flame contact with the building from a spreading fire. In this strategy, vegetation, including ornamental plants, non-native, naturalized or invasive plant species may be removed and are re-planted with fire- and drought-tolerant species, or may be thinned to decrease the available natural vegetative fuel loading on the property. The reduction of available fuel effects the flame lengths and the amount of heat produced by the fire and decreases fuels around houses that can ignite through firebrands and ember showers produced by wildfires moving across the landscape.

Each sub-zone in a Fuel Modification Plan is designed to lower the amount of fuel available to a wildfire the closer the fire gets to a building. Additionally, the amount of moisture retained by plants inside Fuel Modification Zones increases as the distance from buildings decreases. However, it is important to remember that following Fuel Modification principles (removal of flammable vegetation, thinning flammable vegetation and providing irrigated fire resistant landscaping with in perpetuity maintenance of defensible space) does **not** guarantee structure survivability during wildfires. This strategy merely increases the chance of survivability to a reasonable level of relative safety.

Because of the nature of Southern California soils, it is imperative to consider the potential for hillside erosion and the need for slope stabilization. Every effort should be made to avoid the need for total removal of native vegetation on hillsides. Increasing structural setbacks for proposed structures on slopes will reduce the amount of work required on the adjoining hillside as well as improving defensible space around the structure. Efforts should be made to use modified native vegetation on slopes as much as possible to provide adequate hillside stabilization. Native plants are better adapted to local topography and provide important wildlife habitat and protection from erosion. Erosion concerns, combined with the need to address water conservation measures, require the careful selection of plant species as well as the placement of pathways, patios, retaining walls and other landscaping features so that a well-designed fire-wise landscape provides an environment that accomplishes more than achieving the goal of fire safety mitigation.

Defensible space can be accomplished in ways other than plant modification. Paved brick, gravel pathways, rock borders, dry streambeds, water features, swimming pools and other features made of non-combustible materials can contribute to a structure's defensible space. Structural survivability can also be improved through the use of fire resistive building construction standards as outlined in Chapter 7-A and 7-B of the California Building Code.

#### **4.8.2.1 General Fuel Modification Zone Requirements**

##### **4.8.2.1.1 Fuel Modification Zone 1**

Fuel Modification Zone 1 comprises the first defensible space surrounding a building and has a minimum width of 50 feet. Fuel Modification Zone 1 includes the level building pad. If 50 feet is not obtainable around each structure on a lot, each individual lot owner is still required to maintain his or her front, side and back yards to a zone depth of 50 feet on the flat building pad and on natural slopes or manufactured slopes around their homes with irrigated fire resistant Zone 1 landscaping requirements.

Plants in this irrigated Zone will not include any pryophytes, which are high in oils and resins, including eucalyptus, cedar and juniper species (***see Appendix A*** - Prohibited Plant list). Trees must be planted and maintained so that when they reach maturity their branches are at least 10 feet away from any structure.

This fire-resistant landscaped zone is permanently irrigated and will consist of fire resistant and maintained plantings. Thick succulent or leathery leaf plant species are the most fire resistant' plants with paper-thin leaves and small twiggy branches are the least fire resistant.

Regular maintenance and continued irrigation is very important in Zone 1. Plants with

high moisture content are less likely to burn. Sidewalks, concrete patios, decorative rock, swimming pools, and similar landscape features may be included in this zone (and Zone 2) as these features will not support fire.

This irrigated zone (unless irrigation causes erosion) consists of native and non-native fire resistant and maintained plantings less than 18 inches high. This Zone may also contain fire resistant specimen size trees or single well-spaced ornamental shrubs taller than 18 inches, intermixed with ground covers

Although all plants will burn under extreme fire conditions, research has shown that some types of plants, including many natives, are more fire resistant than others. The Recommended Plant List in **Appendix 'A'** includes a list of low fuel volume, non-oily, non-resinous plants commonly referred to as "fire resistant". This term comes with the caveat that these plants must be annually pruned, all dead wood removed, and all grasses or other plant material are removed from beneath the circumference of their canopies. The Recommended Plant List in **Appendix 'A'** includes native species occurring on the project property that are not considered undesirable from either a biological or wildfire risk management perspective if they are properly maintained by June 1st of each year.

(See **Appendix D** for Fuel Modification Zone 1 requirements).

#### **4.8.2.1.2 Fuel Modification Zone 2**

Fuel Modification Zone 2 starts at the outer perimeter edge of Zone 1 and extends outward for an additional 50 feet but may extend beyond the minimum required depth of 50 feet (for a minimum total defensible space of 100 feet). Zone 2 Fuel Modifications thin out fifty percent (50%) of vegetation canopies in the area, especially in undesirable plants (**See Appendix A**). Zone 2 also requires the removal of dead and dying materials in vegetation canopies; thinning, lacing and pruning of branches; and mowing and weed-whipping of grasses and weedy plants. Landscaping and maintenance of plantings will include limited irrigation to ensure establishment of fire-resistant landscaping (ground covers, shrubs and trees).

(See **Appendix D** for Fuel Modification Zone 2 requirements)

#### **4.8.2.2 – Defensible Space Around Buildings**

Fuel modification zones are required around every building designed for human habitation and buildings designed to house farm animals.

Fuel modification zones shall comply with the following requirements:

(a) When a building is located 100 feet or more from the property line, the fuel modification zone shall have a depth of 100 feet from habitable buildings. The area

within the first fifty (50') feet of buildings shall be cleared of non-fire resistive vegetation and re-planted with fire-resistant plants or approved irrigated landscaping. In the area between 50 to 100 feet from a building, all dead and dying vegetation shall be removed. Native vegetation may remain in this area if the vegetation is modified and thinned so that combustible vegetation does not occupy more than 50% of the area. Trees may remain in both areas provided that the horizontal distance between crowns of adjacent trees and crowns of trees and structures is not less than 10 feet.

(b) When a building or structure in a hazardous fire area is setback less than 100 feet from the property line, the requirements above shall be met to the extent possible in the area between the building and the property line.

(c) The building official and the FAHJ may provide lists of prohibited and recommended plants. Samples of prohibited and recommended plant lists are included in Appendix A.

(d) When the subject property contains an area designated to protect biological or other sensitive habitat or resource, no building or other structure requiring a fuel modification zone shall be located so as to extend the fuel modification zone into a protected area.

All required Fuel Modification Zones and Defensible Spaces shall be in place prior to Final Building Inspection and issuance of a Certificate of Occupancy. Fuel Modification Zones and Defensible Space shall be maintained in perpetuity.

Representatives of the Alpine Fire Protection District shall have the right to enter private property to insure the fuel modification zone requirements are met.

#### **4.8.3 Vegetation Management Practices**

Fuel Modification Zones must be maintained to fulfill the requirements of this Fire Protection Plan and meet the requirements of the Alpine Fire Protection District. Maintenance shall include, but is not limited to, initial planting, weeding, irrigation installation, maintenance and plant pruning, the removal of dead or dying and downed vegetation and replacement of plants as required.

The following requirements shall apply to this project:

1. Each property owner shall be responsible for all irrigation and landscaping of Fuel Modification Zones within their property boundaries. Fuel Modification Zones and Defensible Space shall be limited to the area within established property lines and shall not extend off-site of established parcels.

2. The Alpine Fire Protection District will hold each parcel owner within the proposed project accountable for enforcement of all wildfire protection issues discussed in this Fire Protection Plan.
3. Each property owner shall not allow dumping of trash or disposal of yard trimmings within Fuel Modification Zones and Defensible Space areas.
4. The Alpine Fire Protection District, or its designated representative(s), shall decide any disputes relating to individual lot landscaping or fuel treatments involving the interpretation of this Fire Protection Plan. Decisions made by the Fire Protection District shall be final and binding on property owners.
5. If modifications to the Tentative Map Plans occur, any and/or all of the Fire Protection Plan may be revised at the discretion of the Alpine Fire Protection District.
6. All exterior boundaries of Zones 1 and 2 Fuel Modification Zones shall be permanently marked on the ground for the purpose of guiding annual fuel management maintenance and inspection operations. The most reliable markers are steel fence posts with a baked-on painted finish. The upper half of the aboveground portion of the fence post shall be painted a bright “day-glow” orange color to improve visibility. Fuel Treatment Zone markers shall be spaced so that other markers on each side of installed markers can be readily seen from that marker.
7. Brush removal shall be completed prior to commencing any flammable construction.
8. During construction at least 50 feet of clearance around the structures shall be free of all flammable vegetation as an interim fuel modification zone during construction of any structure.
9. Debris and trimmings produced by thinning and pruning will be removed from the site
10. The annual completion of all designated Fuel Modification Treatments will occur before June 15<sup>th</sup>.
11. All individual landscaping plans, including additional structures, will comply with the Fire Protection Plan.
12. Trees and plants will be planted in accordance with the County of San Diego Approved Plants for Defensible Space in Fire Prone Areas List as shown in Appendix A or as approved by the Alpine Fire Protection District.

#### **4.9 Cumulative Impact Analysis**

San Diego County's weather, fuel, and terrain contribute to the development of intense, uncontrolled wild fires as evident by the recent Cedar, Paradise and Otay fires of October 2003 and the Witch, Harris and Poomacha Fires of 2007. The areas of greatest concern for the impact of wild fires on developments are projects immediately adjacent to, or intermixed with, undeveloped wild land areas or unmanaged vegetation stands in



Open Space preserves. As the population of San Diego County increases and the Wildland Urban Interface (WUI) expands, fire hazards and risks will continue to be encountered. Vehicle access to residential subdivisions next to WUI areas or Open Space easements and an increase in other human activities in these areas increases the risk of property loss, injury or death and contribute to the impact of potential wild land fires.

The proposed development of the parcel is an in-fill project between existing developed residential and other undeveloped properties.

Victoria Estates proposes a twenty-three (23) lot land division for future residential development on a currently undeveloped parcel covered with unmanaged native, naturalized and invasive vegetation. The existing undeveloped parcel represents a potentially significant fire hazard to adjacent off-site properties and creates an unrestricted path of fire extension into developed residential areas. These threats will continue until the mitigations proposed by this Fire Protection Plan are implemented with the development of the parcels.

Development of the Victoria Estates property will provide the Project Site and surrounding residential development with enhanced water supply and fire hydrant distribution.

Development of Victoria Estates will have a positive impact on Alpine Fire Protection District finances. The current San Diego County Fire Mitigation Fees, based on \$0.58 per square foot of habitable space, will provide an initial return of between \$1450.00 (anticipated 2500 square foot Single Family Dwelling) to \$2320.00 (4000 sq.ft. SFD) to the District for capital improvements such as apparatus replacement, hose purchase, fire station maintenance and firefighting equipment. Twenty single family dwellings with a 2500 square foot footprint will provide the District with an estimated minimum one-time benefit of \$26,000.00 for capital expenditures.

Based on an estimated, minimum \$700,000 sales price, an estimated \$140,000.00 per year in 1% general San Diego County property taxes will be raised, a portion of which will be returned to the District for operating expenses.

- Alpine Fire District will receive \$21,000.00 in property taxes for the Project, based on a tax receipt rate of \$0.15 received for every tax dollar collected.

The proposed single family dwellings on the project site will produce annual fire assessment fee income of \$1340.00 for the Alpine Fire District (based on a \$67.04. assessment of four benefit units per dwelling; one benefit unit = \$16.76).

## **CHAPTER 5 MITIGATION MEASURES & DESIGN CONSIDERATIONS**

### **5.1 – Road and Access Mitigations**

#### **5.1.1 Existing Road and Access**

The Project Site currently has two major ingress and egress routes.

The southern route along Victoria Meadows Drive and Victoria Circle, has a forty (40') foot improved paved width all weather road surface. The paving surface appears to be in fair to good condition, exhibiting moderate amounts of weathering, but with no obvious potholes or repairs. The development west of the Alpine 21 Project Site is not a gated community; there are no obstructions, traffic calming devices or chokepoints along the lengths of either Victoria Meadows Drive or Victoria Circle.

The northern route is along Victoria Circle has an all-weather paved surface with an improved width of forty (40') feet. The paving surface appears to be in fair to good condition, exhibiting moderate amounts of weathering but with no obvious potholes or repairs.

The development west of the Alpine 21 Project Site is not a gated community; there are no obstructions, traffic calming devices or chokepoints along the lengths of Victoria Circle.

Immediate access to the Project Site is on Country Meadows Road. Country Meadows Road has an initial paved width of thirty-two (32') feet that narrows to a private driveway with an improved paved width of sixteen (16') feet. The paving surface appears to be good condition. The sixteen (16') foot private driveway slope of 20.7% exceeds the current maximum grade permitted by the San Diego County Consolidated Fire Code.

#### **5.1.2 – Proposed Mitigations**

##### **5.1.2.1 – Streets and Roadways**

The County Consolidated Fire Code and Alpine Fire Protection District Ordinances require new streets serving more than two single family dwellings to have a minimum improved width of twenty-four (24') feet.

The Alpine Fire Protection District has required that all Project roads and streets shall

have an unobstructed paved width of thirty-two (32') feet, with parking permissible on one side of the roadway. If parking is desired on both sides of the road, the improved paved width shall be widened to forty (40') feet.

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**Finding:** *The Project has proposed the installation of streets with an improved paved width of thirty-two (32') feet. The proposes streets will provide eight (8) additional feet of paved width beyond minimum Fire Code requirements.*

**Finding:** *Grading of the new right-of-way route for Country Meadows Road will increase the width of the existing paved section from sixteen (16') feet to thirty-two (32'), a gain of sixteen (16') feet.*

**Finding:** *Grading of the new right-of-way route for Country Meadows Road and Christina Leigh Way will eliminate the excessive grade of the existing private driveway at the current terminal end of Country Meadows Road.*

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#### **5.1.2.1.1 – Roadway Surface**

Alpine FPD has required that roadway surfaces shall have the capability of supporting the imposed loads of fire apparatus with a designed minimum weight bearing capability of 75,000 pounds.

The Project proposes grades on Country Meadows Road and Christina Leigh Way that exceed 15%.

The County Consolidated Fire Code and Alpine Fire Protection District Fire Code Adoption Ordinance requires that any roadway with a grade exceeding 15% must provide mitigations to resolve fire apparatus traction problems on steep hillsides.

Both Fire Codes require a Portland cement concrete driving surface that is deeply broom-brushed perpendicular to the travel direction, creating a corrugated pavement enhancing traction for heavy vehicles using the roadway.

Other paving surfaces may be used if 1) the are approved by both the Alpine Fire District and the County of San Diego; 2) meet current Department Public Works requirements for private and/or public streets; and 3) provide an Alternate Means of Compliance with the Same Practical Effect as the brushed concrete road surface.

The County Consolidated and Alpine Fire District Fire Codes do not allow road gradients to exceed 20%.

**5.1.2.2 – Private Driveways** – all private driveways on the project site will be provided with an approved all-weather paved surface. Driveways shall have an improved paved minimum width of sixteen (16') feet.

Driveway slopes shall not exceed 15% without additional mitigation consisting of a minimum of three (3") of concrete that is brushed perpendicular to the driving surface to provide additional traction. Driveway widths shall have a minimum improved paved surface of sixteen (16') feet and maximum slope shall not exceed 20%. Angle of approach and departure at the intersection of driveways and roads shall not exceed 7 degrees or a 12% slope.

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**Finding:** *Driveways serving Lots 1, 3, 5 and 6 exceed 15% gradient. Alpine FPD has required that these driveways have the appropriately brushed concrete driving surface.*

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Driveways exceeding a length of 150 feet from streets shall be provided with approved Fire Department Turnarounds. Fire Department Turnarounds have been planned to Parcels 2, 3, 5, 6, 7, 10.

All required fire department turnarounds shall conform to the prescriptive requirements of the California Fire Code, Alpine Fire Protection District and San Diego Fire Authority specifications for width, length of driving legs, corner and curve radii, driving surface materials and other related specifications (**See Appendix B for configuration requirements**).

**5.1.2.3 – Fire Apparatus Access Road Obstructions** - The Developer has made an agreement with the Alpine Fire Protection District that all roads, excluding private driveways, shall have a minimum improved paved width of thirty-two (32').

**Finding:** The Alpine Fire Marshal will allow parking on one side of all Project roads and streets having a minimum unobstructed paved width of thirty-two (32') feet. The side of the street which does not allow parking shall be designated as a Fire Lane.

Fire Lanes shall be provided with red curbs and posted signs that identify the presence of the Fire Lane.

Red curbs shall be supplied with white stenciled letters that are plainly visible from vehicles, which indicate the presence of the Fire Lane and prohibit parking.

Fire Lane Signs shall be posted thirty (30') feet apart, identifying the Fire Lane and mandating "No Parking", along the length of all restricted road ways.

Signs, posting, red curbs and white stenciling shall comply with the requirements of Section 22500.1 of the California Vehicle Code. Signs, posts, red curbs and white stenciling shall be maintained in perpetuity as part of the road maintenance agreement.



**Typical Approved Fire Lane/No Parking Sign**

#### **5.1.2.4 – Length of Dead-end Roadways**

The maximum length of dead end roads system for proposed property developments is a function of County Zoning requirements.

For parcels zoned one (1) acre or less, the maximum length of a dead-end road is 800 feet. For parcels between one (1) and 4.99 acres, the maximum dead-end length is 1320 feet.

For parcels between five (5) and 19.99 acres, the maximum dead-end length is 2640 feet.

All parcels on the northern side of the Project site exceed one (1) acre, with the overall average lot size being 1.89 acres.

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**Finding:** The Project Site will be-zoned as A-70, with Land Designation SR-1 Semi-Residential Zoning, with minimum parcels sizes of one (1) acre. Maximum length of dead-end roads serving the proposal parcels with sizes between one and 4.99 acres is 1320 feet.

**Finding:** All parcels on the southern side Phase 2 portion of the Project site exceed five (5) acre, with the overall average lot size being 6.05 acres. The maximum length of dead-end roads serving the southern Phase 2 portion of the Project will be 2640 feet, per the existing development agreement(s) between the Developer, San Diego County and the Alpine Fire Protection District.

**Finding:** Country Meadows Road has an estimated road length of 1134 feet from its intersection with Victoria Circle and its terminal cul-de-sac bulb. Country Meadows Road complies with dead-end road length prescriptive requirements.

**Finding:** The combined dead-end length of all Project Phase 2 streets, from the intersection of Victoria Circle to the eastern terminal cul-de-sac bulb of Christina Country Court is estimated to be 2108 feet. The total of all dead-end roads in Phase 2 as accessed from East Victoria Circle complies with the prescriptive requirements for lots zoned between five and 19.99 acres.

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**Discussion:**

At the time of original design, under an agreement by the property owners, a second access point to the Project was to be provided from East Victoria Drive. That agreement was subsequently, and unilaterally, withdrawn by the owner furnishing easement rights to the East Victoria right-of-way.

Environmental constraints associated with the riparian creek-bed transecting the Project Site have also eliminated access to the proposed secondary access point.

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**Finding:** *The Alternate Means of Compliance proposal (outlined below) takes into consideration that the agreement for the original secondary access point was unilaterally eliminated and is now a significant Project constraint.*

**Finding:** *The Alpine Fire Marshal stated in the Project Conditions attached to the Project Facility Availability Form 399-F that the District will take into consideration dead-end road maximum lengths created by any re-zoning of proposed sub-divisions.*

**Finding:** *In telephone conversations, at different times, with the Alpine Fire Marshal and the Developer's Project Engineer, the Consultant has determined that, based on the original parcel sizes and zoning, that the proposed dead-end road lengths in the most recent rendition of the Project will be acceptable to the Alpine Fire District if other road engineering and fire and life safety requirements for access roads are met as declared in the Project Conditions. Roads serving the southern portion of the Project may have a maximum length of 2640 feet, contingent on all parcels in this Phase having a minimum five (5) acre parcel size.*

**5.1.2.4.1 Dead End Road Length Mitigations**

To insure that the Alternate Means of Compliance for any potential over-length dead end roads serving the Project Site have the Same Practical Effect of providing Fire Apparatus Access Roads with remotely located access points, the following mitigations will be provided for the Project:

1. Minimum unobstructed paved width of all road ways shall be thirty-two (32') feet.
- 

**Finding:** *Thirty-two feet (32') of paved width provides eight (8') feet of additional roadway width compared to the minimum required paved width of twenty-four (24') feet required in residential developments and twelve (12') feet of paved width for twenty (20') foot improved widths required for single family dwellings built in State Responsibility Areas (SRA) as regulated by California Code of Regulations, Title 14.*

**Finding:** *The Project is proposing thirty-two (32') foot wide roads throughout the project site.*

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2. Parking of vehicles will be allowed only on one side of roadways serving the Project Site. If parking on both sides of roadways is desired, the minimum improved paved width of roadways shall be increased to a minimum width of forty (40') feet.
3. Roadway turning radius points shall be a minimum of thirty-six (36') feet as measured along the inside edge of the improvement width.
4. Minimum unobstructed radius of all cul-de-sacs shall be thirty-six (36') feet.
5. No speed bumps, speed humps, speed control dips or other means of hindering fire apparatus response speeds through the development will be provided or installed along the road system.
6. Community gates at the entrance to the Project or at intersections of Project access roads and streets shall be prohibited.
7. The Alpine Fire District shall approve individual electric-powered driveway gates before installation. Electric gates shall be provided with a Knox, or equivalent, key pad unlocking mechanism, with approved lock tumblers matching the Alpine Fire District general access (Heartland "A") emergency key. Electric gates shall be provided with manual override or battery powered unlocking mechanisms for uninterrupted gate operations in the event of power failures. At the discretion of the Alpine Fire Marshal, electric gates may also be required to be equipped with emergency traffic control strobe sensor reception devices that will open gates upon approach of emergency vehicles.
8. The road system throughout the Project Site shall be provided with roadside defensible space. Vegetation management shall be provided for a minimum depth of thirty (30') feet along both sides of the access road right-of-way corridors. Flammable vegetation shall not be planted, or allowed to naturally grow, along any right-of-way road shoulder.

## **5.2 – Water Supply Mitigations**

### **5.2.1 Existing Water Supply**

The existing water supply for the Project is off-site and in the existing sub-division area.

The nearest fire hydrant is at the intersection of Country Meadows Road and Victoria Circle. It is manufactured by Jones and is provided with two 2-1/2" and one 4" discharge ports. Additional fire hydrants are distributed at Code and Ordinance required and Alpine Fire Marshal approved intervals throughout the established sub-division.

### **5.2.2 Padre Dam Municipal Water District Project Conditions**

The Padre Dam Municipal Water District has required the following Conditions for Project Approval:

- Installation of a potable water system per Padre Dam specifications
- Dedication of water system easements for public portions of the water system
- Provisions of a twelve (12') foot wide road over a twenty-five (25') foot easement to service and maintain water infrastructure
- Installation of a looped water main from the existing 12" main near the southeast corner of the Project Site to service the Phase 2 area.
- The looped main is to have clearance from the Open Space Tracts with no restrictions
- Water mains appropriately sized to provide the minimum 2500 g.p.m. fire flow requirement for new sub-divisions
- Identifies a service limit for proposed fire hydrants on the eastern cul de sac of Country Meadows Road
  - Maximum elevation of hydrants cannot exceed an elevation of 2160 feet.

### **5.2.3 Proposed Mitigations**

The existing water supply exceeds the maximum hose lay and hydrant spacing distances permitted by the latest editions of the California Fire Code, Alpine Fire Protection Distance and the County Consolidated Fire Code for service within the Project Site.

**Option 1** - To provide the most effective hydrant spacing and reasonable hose lay distances between proposed structures and the new water supply infrastructure, it is recommended that a minimum of seven (7) fire hydrants be installed at the following locations:

- At the southwest corner of the intersection of Country Meadows Road and Chelsea Leigh Way cul-de-sac bulb at the northeast corner of Lot # 8.
- At the northeast corner of Lot # 9 on Country Meadows Road
- At the southwest corner of Country Meadows Road cul-de-sac bulb at the northeast corner of Lot # 8
- At the northwest corner of Lot # 10
- At the western cul-de-sac bulb of Christina Country Court , at the southwest corner of Lot # 12.
- At the tee intersection of Christina Country Court at Chelsea Leigh Way, south side of the intersection, at the northeast corner of Lot # 15
- At the eastern cul-de-sac bulb of Christina Country Court, southwestern side at the northeastern corner of Lot # 16.

Option 1 is based on hydrant spacing distances of approximately 300 feet, with hydrants installed per the County Consolidated Fire Code requirements at intersections and cul-de-sac bulb entrances.

***Finding: On May 11, 2017, the Alpine Fire Marshal indicated that the Fire District intends to use Option 1 for the location and placement of hydrants for the Project.***



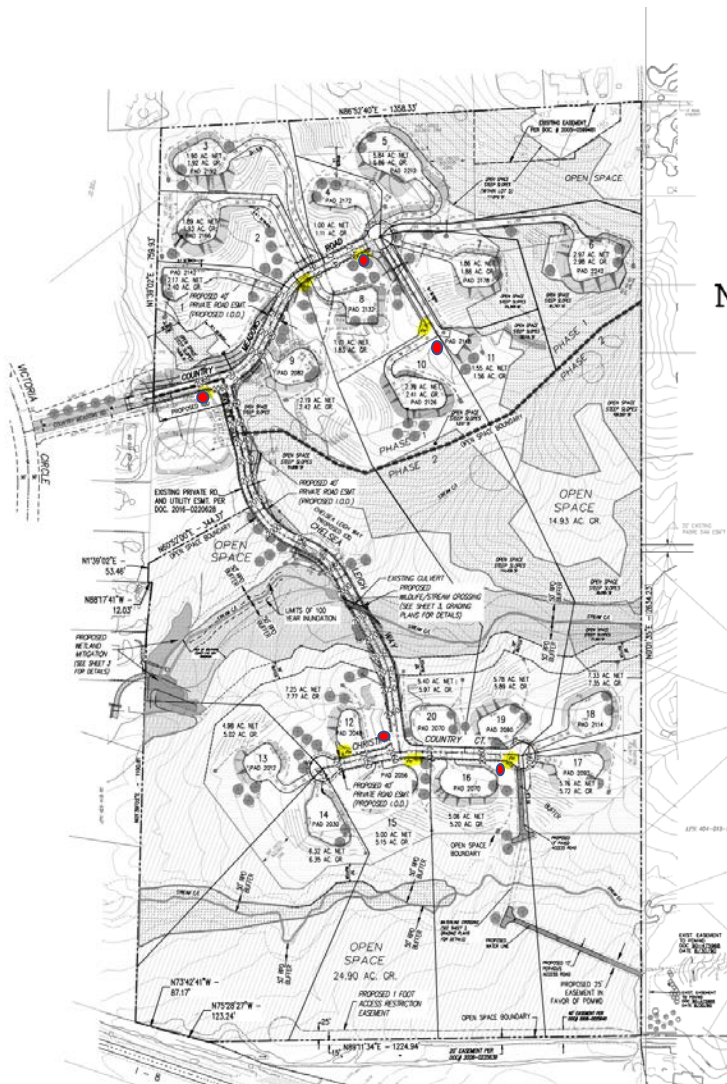
APN 404-243-1

## **Option 2**

To provide reasonable Code compliant hydrant spacing, and reasonable hose lay distances between proposed structures and the new water supply infrastructure, it is recommended that a minimum of five (5) fire hydrants be installed at the following locations:

- At the southwest corner of the intersection of Country Meadows Road and Chelsea Leigh Way
- At the southwest corner of Country Meadows Road and Christina Country Court
- At the northeast corner of Lot # 10 at the driveway split on Christina Country Court
- On the northwest corner of the driveway for Lot # 12
- On the tee intersection on Chelsea Leigh Way, on the north side of Lot # 17
- On the southwest entry of the cul-de-sac bulb at Lot # 18

Option 2 is based on hydrant spacing distances of approximately 500 feet, with hydrants installed per the County Consolidated Fire Code requirements at intersections and near cul-de-sac bulb entrances.

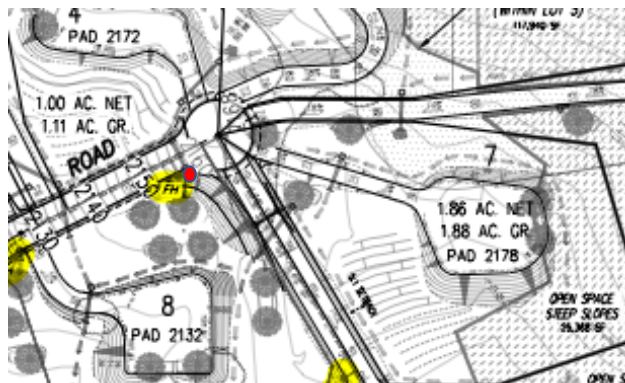


**Figure 5.2.2.1 – Proposed Hydrant Locations (Option 2) – RED circles  
Overlaid with Option 1 Locations (highlighted)**



**Finding:** Alpine Fire Protection District has required the installation of five (5) fire hydrants, one (1) at each cul-de-sac and two (2) spaced along the Project road ways. The Alpine FPD Fire Marshal will determine the location of the two road-side fire hydrants.

**Finding:** Both Options provide hydrant locations at the east side of Country Meadows Road that do not exceed the service limitations identified by the Padre Dam Municipal Water District.



***Proposed Country Meadow Road Cul-de-Sac Hydrant Location***

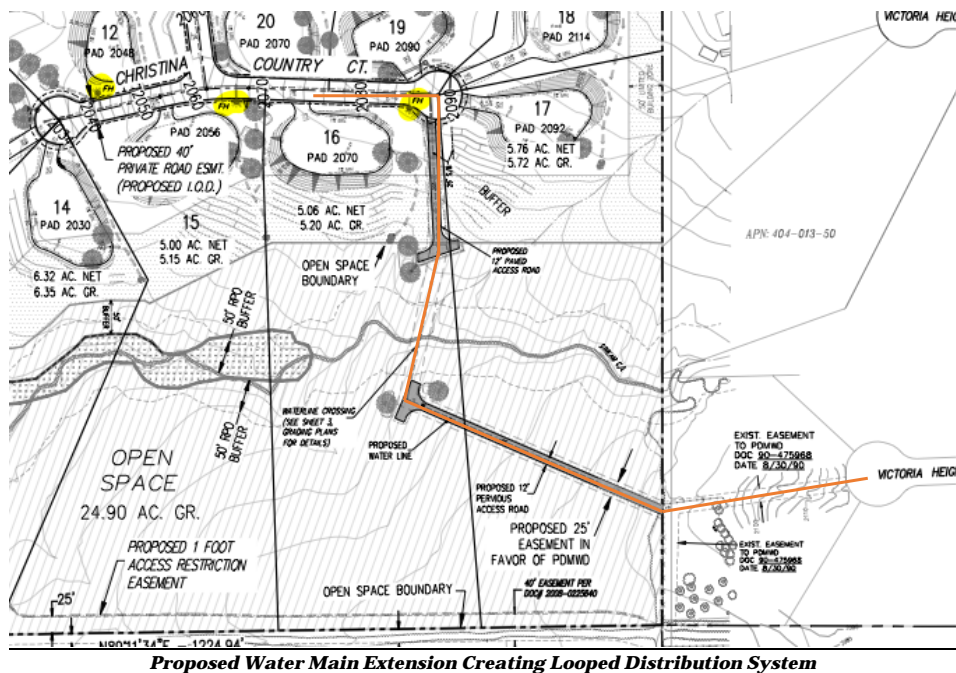
#### **5.2.3.1 – Improvements to Water Delivery Infrastructure**

As a Condition for Padre Dam Municipal Water District approval, and to meet infrastructure needs, the Developer was required to provide a water main loop from an existing twelve (12”) inch main located beneath Victoria Heights Place, near the southeast corner of the Project Site, to the proposed water delivery main(s) that will be installed for the remaining parts of the Project.

The proposed water distribution main will be sized to meet the 2500 g.p.m. fire flow requirement for the Project. The main size will be determined by Padre Dam's Engineering Staff.

The proposed water main will be installed beneath the dedicated Open Space Area in the southern end of the Project Site. The Developer has negotiated with Padre Dam to provide a twenty-five (25') foot wide easement between Victoria Heights Place and the cul de sac bulb at the eastern end of Chelsea Leigh Way between Parcels 16 and 17.

A maintenance road, with a paved width of twelve (12') feet will be provided on two sides of the easement. Both sides of the maintenance road will terminate in approved "tee" ("hammer-head") turn-arounds before the road extends into the restricted wetland area that extends in an east-to-west configuration through the center of the Open Space Area.



### **5.3 – Ignition Resistant Construction and Automatic Fire Sprinkler Mitigations**

#### **5.3.1 Existing Structures**

There are no existing structures at the project site.

#### **5.3.2 Proposed Mitigations**

All new buildings and structures shall be provided with automatic fire sprinklers complying with National Fire Protection Pamphlet 13-D - Fire Sprinklers for One- and Two-Family dwellings.

All new and future buildings and structures will be required to conform to Chapter 7-A of the County of San Diego Building Code for Ignition Resistant Building Construction Standards for Wildland-Urban Interface Areas and California Building Code Chapter 7-A construction standards.

Examples of detailed, but not-all-inclusive, requirements for building construction in Very High Severity Areas are included in **Appendix C**.

**Finding:** *Table 705.8 of the California Building Code regulates the maximum area of exterior wall openings based on the distance between buildings and the type of protection associated with the wall opening.*

All new buildings erected on the Project Site should meet Type V-A Construction. Type V-A wood frame construction corresponds to exterior walls that have a minimum one-hour Fire Resistive rating. One-hour fire resistive exterior walls comply with the California Building Code Chapter 7-A and County of San Diego Enhanced Fire Resistive Building Construction requirements for exterior walls. In addition, all occupiable buildings are required to have automatic residential fire sprinkler systems.

Considering these factors, new single family residences built on the project site will:

- Have automatic fire sprinklers
- Have one-hour Fire Resistive rated construction
- Have a minimum side yard separation distance of thirty (30') feet between structures
- Are allowed to have 100% of allowable openings without restriction or fire resistive protection

TABLE 705.8 MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION		
FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION	ALLOWABLE AREA*
30 or greater	Unprotected, Nonsprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S) <sup>d</sup>	Not Required
	Protected (P)	Not Required

---

**Finding:** *In the ISO Standards Manual, Guide for Determination of Needed Fire Flow, 2006 Edition, buildings closer than forty (40') from each other are considered to have an exposure impact.*

---

Using the formula:  $NFF = C_i (O_i) [1.0 + (X+P)]$

The fire flow for a particular building can be determined, where:

$$C_i = 18F (\sqrt{A})$$

Where F = coefficient of construction (wood frame = 1.5)  
A = effective area

$O_i$  = Occupancy type (C-2 limited combustibility = 0.85)

$X+P$  = 0.126 (exposure coefficient for wood frame building with 30' separation)

For a 2400 square foot wood frame building, the required fire flow is

$$NFF = C [(18)(1.5)\sqrt{2400}] \times O (.85) \times (1.0 + 0.126)$$
$$NFF = 1191.510195 \text{ gpm}$$

Certain exceptions apply to Needed Fire Flow formula calculations:

- The fire flow calculations only apply to commercial buildings
- The fire flow calculations have limited application to sprinklered building

Thus, while considering a commercial building within forty (40') of the walls of another commercial building to have an exposure problem, the ISO does not consider a residential building thirty (30') feet from another residential building has having an exposure problem. This can be validated by dropping the construction factor of 0.126 in the exposure portion of the formula, whereby the needed fire flow for a 2400 square foot, fully involved single family residential building becomes 1058 gpm, or a difference of 133 gpm.

---

**Finding:** *With a non-penalizing exposure distance and exception provided by installation of automatic fire sprinklers, a reduced ISO fire flow requirement for buildings on the Project Site is allowed.*

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With fire resistive exterior wall construction, a reduced ISO fire flow requirement for buildings on the Project Site is allowed.

The County of San Diego Consolidated Fire Code and the Alpine FPD Fire Code permits calculation of required fire flow for proposed buildings in Wildland Urban Interface Zones to be calculated using the ISO Fire Flow Determination Formula.

The California Building Code does not consider the less than 70 feet of Zone 2 Defensible Space (FMZ) as a hazardous condition and does not require fire resistive protective over exterior wall openings.

The built-in Ignition Resistant Construction standards mandated by California Building Code Chapter 7-A provide sufficient protection from radiant, convection and direct flame contact heat exposures to prevent direct ignition from exterior exposure to wildfires.

***Conclusion: As an Alternate Means of Compliance, the proposed construction features of the buildings and the installation of automatic residential fire sprinklers provide same practical effect mitigation for the reduced fuel modification zone depth and defensible space limit of 100 feet or to the property line, whichever is closer, set by the California Public Resources Code 4291.***

---

## **5.4 - Defensible Space and Fuel Modification Mitigations**

As previously stated, Fuel Modification Zones on properties are areas where vegetation has been removed, planted with alternative landscaping or modified in other ways to increase the likelihood that structures will survive a wildfire, improve defensible space around the structure for firefighting activities and prevent flame contact with the building from spreading fires.

### **5.4.1 – Proposed Mitigations**

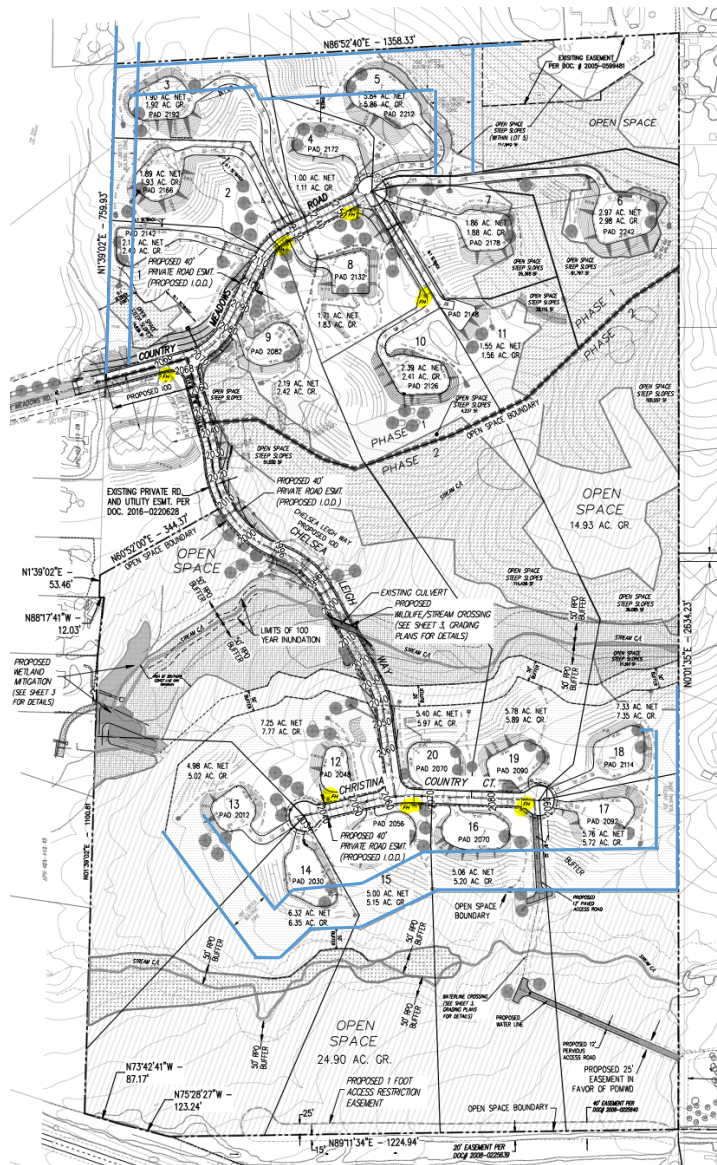
Defensible Space Mitigations for proposed single family dwellings on the Project Site will necessitate several different overlaying types of Fuel Modification Zones for effective defense against the recognized and potential fire threats imposed on the buildings by the existing and planned environment and constraints.

#### **Limited Building Zones**

The Developer has proposed Limited Building Zones placed around, or adjacent to, all proposed residential buildings on the Project Site. Limited Building Zones (LBZ) are designed to prevent structural fires from spreading into, and igniting, valuable environmental resources in designated Open Space Easements. Environmental regulations do not allow encroachment of buildings or structures into LBZ areas. However, the depth of LBZ areas may be used for fuel modification zone purposes. Figure 5.4.1.a represents the Project proposed Limited Building Zones.







TM5431 ALPINE 21 TENTATIVE MAP FIRE PROTECTION PLAN

**Figure 5.4.1.a – Proposed Limited Building Zones on Project Site**  
**Alpine Fire District Fuel Management Requirements**

The Alpine Fire Marshal has required the following conditions for Defensible Space and Fuel Management:

1. A minimum of one hundred (100') feet of defensible space (or to the property line, whichever is closer) shall be maintained on all parcels.
2. Because of slope and terrain features, Parcels 5, 6, 7, and 11 shall all have a full one hundred feet (100') of defensible space.
3. Roadside Defensible Space shall be provided along roadways.
4. Ignitable vegetation shall not be planted within Roadside Defensible Space areas.
5. All trees shall be limbed up eight (8') feet above the ground. This minimum ground to canopy clearance shall be maintained at all times.

**Project Defensible Space Mitigations Provided**

An evaluation of the Project Site reveals that numerous parcels, in addition to those specified by the Alpine Fire Marshal, may be significantly impacted by the presence of steep slopes, inaccessible terrain, terrain features and full or partial encirclement by unmanaged vegetative fuels located in the proposed three (3) Open Space parcels on the Project Site.

---

**Finding:** *The parcels impacted by Open Space encroachments, slopes and terrain features include Lots 9 and 10 in Phase 1 and all Phase 2 lots (12 through 20).*

**Finding:** *The SH-5 and 7 (Heavy and Very Heavy Dry Climate Shrub) vegetation in the three Open Space Tracts are not allowed to be disturbed by hand or mechanical means for the purposes of fuel modification and defensible space under the provisions of the MOU existing between the Fish and Game Service and County of San Diego Fire Agencies.*

**Finding:** *The unmanaged vegetative fuel will continue growing, resulting in additional fuel decadence and increasing amounts of dead and dying vegetative materials in the plant canopies and fuel bed expanse.*

**Finding:** *BEHAVE fire modeling of the SH-5 shrub fuels indicates that estimated flame lengths of forty-one (41') feet will be produced by the fire front as it moves across the landscape.*

---

Based on these Findings, it is highly recommended that the Fuel Modification Zones and Defensible Space areas for the parcels impacted by the Open Space Tracts be increased, providing, as is reasonably necessary and possible, and based on individual parcels constraints, full 100-foot defensible space zones.

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**Finding:** *In situations involving parcel constraints and flammable vegetation impacts, the County of San Diego has allowed for Defensible Space Alternate Means of Compliance methods. In these cases, fuel modification zone depths are adjusted to provide a minimum of doubled the anticipated flame lengths for off-site vegetation. When 100-foot defensible space cannot be provided, fuel modification zone depths shown to provide a safety zone exceeding a projected doubling of flame lengths has the Same Practical Effect as having the required full depth Fuel Modification Zones.*

---

**Discussion:** BEHAVE fire modeling indicates that Fuel Model SH5, Heavy Dry Climate Shrub, will produce longer flame lengths than Fuel Model SH-7, Very Heavy Dry Climate Shrubs. Anticipated SH-5 flame lengths are approximately forty-one (41') feet in all of the terrain features on the Project Site. Doubling the estimate flame lengths will result in defensible space depths with a minimum width of eighty-two (82') feet. The majority of the proposed parcels on the Project Site have the capability of providing defensible space zones using the doubled flame length calculation.

#### **5.4.2 Site Specific Fuel Modification Zones and Defensible Space**

**Finding:** *Site-Specific building envelopes are not shown on the proposed grading plans. In determining configurations for, and depths of, proposed Defensible Space for each lot, the outside edge of each lot's building pad is considered to be the point at which horizontal measurements begin and extend outward to provide the required depth of the Fuel Modification Zone.*

**Finding:** *Fuel Modification Zone depth measurements beginning at the edge of the graded building pad generally provides a greater defensible space dimension than if the measurement began at the exterior wall surface of proposed buildings.*

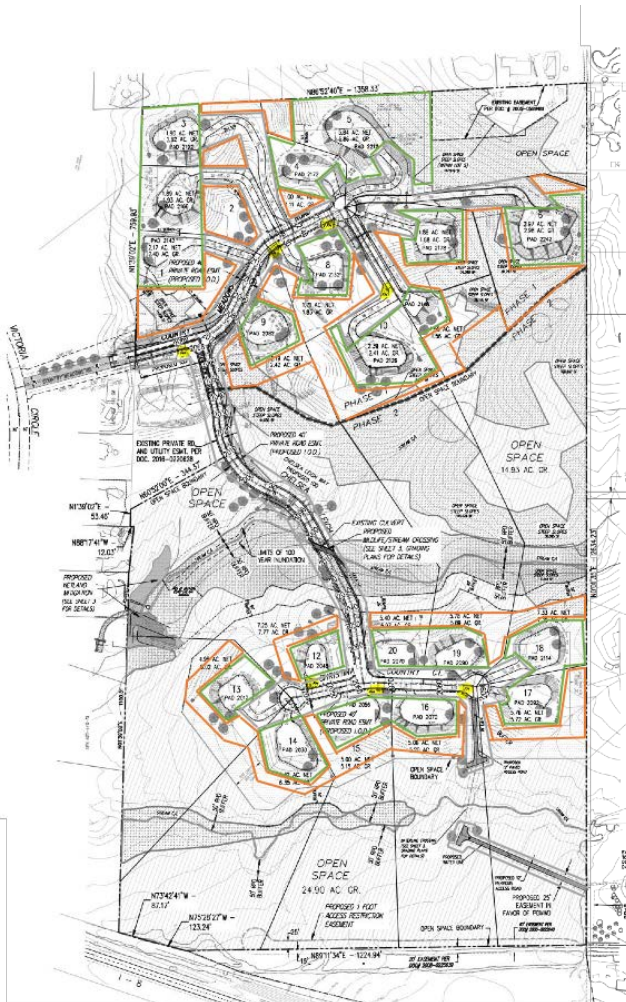
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#### **General Specifications for All Parcels**

1. All parcels shall provide an in-perpetuity Fuel Modification Zone 1 area, with a minimum depth of fifty (50') feet beginning at the edge of the graded building pad and extending laterally outward for a minimum distance of fifty (50') feet.
2. As is reasonably allowable because of site constraints, all parcels shall provide an in-perpetuity Fuel Modification Zone 2 area that extends an additional fifty (50')

feet (or to the property line, whichever is closer) from the perimeter boundary of Fuel Modification Zone 1.

3. All driveways shall provide a Roadside Fuel Modification Zone. Driveway Fuel Modification Zones shall have a minimum dimension of thirty (30') on each side of the driveway. Driveway Roadside Fuel Modification Zones shall comply with Fuel Modification Zone 1 requirements. No flammable vegetation shall be planted, or allowed to remain, in the area used for designated Roadside Fuel Modification Zones. Driveway Fuel Modification Zones may be incorporated into the areas designated as parcel Fuel Modification Zone 1. Driveways traversing designated Fuel Modification Zone 2 and non-mitigated parcel areas shall provide in-perpetuity Fuel Modification Zone 1 mitigations for depth and vegetation management.
4. Roadside Fuel Modification Zones shall be provided along the lengths of all proposed Project streets. Roadside Fuel Modification Zones shall have a minimum depth of thirty (30') feet on each side of the street's right-of-way. Roadside Fuel Modification Zones shall provide in-perpetuity Fuel Modification Zone 1 mitigations. No flammable vegetation shall be planted, or allowed to remain, in any designated Roadside Fuel Modification Zone area.



### ***Proposed Fuel Modification Zones***

**GREEN** Defensible Space Area = **FMZ-1**, 100% clearing & thinning, 0-50 feet from buildings

**ORANGE** Defensible Space Area = **FMZ-2**, 50% clearing & thinning, 50-100 feet from buildings

**YELLOW** Defensible Space Area = **Limited Building Zone (LBZ)** per County mandates for wetlands

**GRAY** Defensible Space Area = **Roadside FMZ**, minimum 30 feet wide along right-of-way shoulders

**WHITE-UNMARKED** lands – **UNMANAGED** vegetation, outside of required Defensible Space depth/width  
**Tree Well Fuel Modification Mitigations**

For purposes of erosion control and water savings mitigation, the County of San Diego has mandated the use of “tree wells” spaced at various locations throughout the Project Site and along slopes and proposed roads, streets and driveways.

The Developer proposes the use of Coast Live Oak trees as the primary species to be planted in proposed tree wells. An additional proposal was to add Engelmann Oaks to the tree well system but, given their flammability and extreme fire behavior and heat release characteristics, it was highly recommended to delete this species from consideration (see Storm King Mountain Firefighter Fatality Report)

The following fire protection recommendations are offered to insure that the proposed tree well system does not increase fire and life safety risks due to wildfire spread into the Project Site:

- All trees shall be listed in the County of San Diego Approved Plants for Defensible Space in Fire Prone Areas List
- Trees shall not overhang or form “arches” over or across driveways, roads and streets
- Crowns on mature trees in defensible space areas shall maintain a minimum horizontal separation distance from other trees, with clearances of ten (10') feet for fire resistant trees and thirty (30') feet for non-fire resistive trees.
- Canopies of mature trees shall have a minimum separation clearance distance from buildings and structures of ten (10') feet for fire resistive trees and thirty (30') for non-fire resistive trees.
- Mature trees shall be pruned to remove lower limbs to maintain a vertical separation distance from ground level vegetation below the tree for a minimum distance of three times (3-x) the height of the ground level vegetation or six (6') feet, whichever is less, above the surface of the ground beneath the tree.
- Dead wood and litter shall be regularly removed from trees
- Ornamental trees shall be limited to groupings of two (2) to three (3).
- Each grouping of ornamental trees shall have a horizontal separation from other groupings of ornamental trees per the Table below:



**TABLE 4907.3.1  
DISTANCE BETWEEN TREE CANOPIES**

Distance between Tree Canopies by Percent Slope	
Percent of Slope	Required Distances Between Edge of Mature Tree Canopies (1)
0 to 20	10 feet
21 to 40	20 feet
41 plus	30 feet

*1. Determined from canopy dimensions as described in Sunset Western Garden Book (Current Edition)*

## **5.5. Residential Solar Systems**

The County of San Diego routinely requires new land development to provide a minimum of 10% of the roof surface area with permanently installed residential solar panel systems.

The following provides basic information about the impact of solar panel system installations and how they potentially impact Fire Department operations and safety.

### **System Identification Markings**

PV systems must be provided with identification marking systems. Marking provides emergency responders with appropriate warning and guidance about working around and isolating the solar electric system. Materials used for marking the system components must be weather resistant.

Locations or equipment to be identified:

- Main Service Disconnect
- Direct Current Conduit
- Raceways
- Enclosures
- Cable Assemblies
- Junction Boxes

Marking should be placed on all interior and exterior DC conduit, raceways, enclosures, and cable assemblies, every 10 feet, at turns and above and/or below penetrations and all DC combiner and junction boxes.

### Access, Pathways and Smoke Ventilation

Access and spacing requirements should be observed in order to:

- Ensure access to the roof
- Provide pathways to specific areas of the roof
- Provide for smoke ventilation opportunities area
- Provide emergency egress from the roof

Roof access points are defined as areas:

- where ladders are not placed over window or door openings
- located at strong points of building construction
- locations where there are no conflicts with overhead obstructions

### Residential Systems—Single and Two-Unit Residential Dwellings

#### **Access/Pathways**

a. Residential Buildings with hip roof layouts: Modules should be located in a manner that provides one (1) three-foot (3') wide clear access pathway from the eave to the ridge on each roof slope where modules are located. The access pathway should be located at a structurally strong location on the building (such as a bearing wall).

b. Residential Buildings with a single ridge: Modules should be located in a manner that provides two (2) three-foot (3') wide access pathways from the eave to the ridge on each roof slope where modules are located.

c. Hips and Valleys: Modules should be located no closer than one and one half (1.5) feet to a hip or a valley if modules are to be placed on both sides of a hip or valley. If the modules are to be located on only one side of a hip or valley that is of equal length, then the modules may be placed directly adjacent to the hip or valley.

#### **Smoke Ventilation**

The modules should be located no higher than three feet (3') below the ridge.

## **CHAPTER 6**

### **CONCLUSIONS**

#### **6.1 Significant Impacts Mitigated by Fire Protection Plan Requirements**

Due to the severity of impacts from the improper management of wild land areas, the existing laws are stringent and regulate all aspects of wild land fire including building standards, fuel modification, water availability/flow, and access.

##### **6.1.1 Emergency Services**

The project site is served by the Alpine Protection District. The Alpine Fire Protection District is an all-hazard fire protection agency that provides services year-round.

The Alpine Fire Protection District is a member of the Heartland Automatic Aid Agreement and San Diego County Fire Mutual Aid Agreement. The Automatic Aid Agreement Supplements Alpine's emergency resources from surrounding career agencies on a closest-engine-basis. Heartland resources responding to wild land fires are assisted by automatic responses from CAL-FIRE and the U.S. Forest Service.

##### **Structure Fire Alarms**

A typical First-Alarm Structure Fire assignment for a fire occurring within the Alpine Fire District would include Alpine Engine 17 (4 personnel), Viejas Engine or Truck 25 (4 personnel, cross-staffing), Lakeside Engine 26 (3 personnel) and Engine 3 (3 personnel), one paramedic unit and one Duty Chief.

Second and Third Alarm assignments will double the First Alarm response for a Second Alarm and triple the First Alarm response for a Third Alarm.

##### **Vegetation Fire Responses**

Three (3) Type I Structure Engines, two (2) Type III Brush Engines, one (1) medic unit  
One Water Tender  
One Battalion/Duty Chief

The Project Site is in State Responsibility Area (SRA). Alpine FPD vegetation fire response levels reflect a standard Heartland Zone Medium Wildland Dispatch response,

with resource levels decreased because of the number of CAL-FIRE fire apparatus and equipment concurrently dispatched to all incidents.

### **CAL-FIRE Vegetation Fire Responses**

Low Wildland – Two (2) Type III engines, one (1) Battalion Chief

Medium Wildland – Four (4) Type III engines, one (1) BC, one (1) bulldozer, two (2) hand crews, two (2) helicopters, one (1) air attack, two (2) air tankers

High Wildland – six (6) Type III engines, one (1) BC, two (2) dozers, four (4) hand crews, three (3) helicopters, one (1) air attack, three (3) air tankers

NOTE: These are basic response levels. Response levels are subject to change based on anticipated weather and fire behavior conditions, staffing patterns for unusual events, and State-wide resource commitments.

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***Finding:*** The fire protection services provided by the District meet or exceed the requirements to reduce the Significant Impact of providing adequate emergency services.

---

#### **6.1.1.2 Emergency Response Times**

The project will be zoned A-70 with land use designation SR-1, Semi-Residential property, and the majority of the proposed residential lots are two (2) or more acres, placing the parcels in the Estate Land Use Category.

Maximum fire travel time for Semi-Rural Residential Land Use Designation for Single Family Dwellings is five (5) minutes.

Table S-1 Travel Time Standards from the Closest Fire Station*		
Travel Time	Regional Category (and/or Land Use Designation)	Rationale for Travel Time Standards**
5 min	<ul style="list-style-type: none"> <li>Village (VR-2 to VR-30) and limited Semi-Rural Residential Areas (SR-0.5 and SR-1)</li> <li>Commercial and Industrial Designations in the Village Regional Category</li> <li>Development located within a Village Boundary</li> </ul>	In general, this travel time standard applies to the County's more intensely developed areas, where resident and business expectations for service are the highest.
10 min	<ul style="list-style-type: none"> <li>Semi-Rural Residential Areas (&gt; SR-1 and SR-2 and SR-4)</li> <li>Commercial and Industrial Designations in the Semi-Rural Regional Category</li> <li>Development located within a Rural Village Boundary</li> </ul>	In general, this travel time provides a moderate level of service in areas where lower-density development, longer access routes and longer distances make it difficult to achieve shorter travel times.
20 min	<ul style="list-style-type: none"> <li>Limited Semi-Rural Residential areas (&gt;SR-4, SR-10) and Rural Lands (RL-20)</li> <li>All Commercial and Industrial Designations in the Rural Lands Regional Category</li> </ul>	In general, this travel time is appropriate for very low-density residential areas, where full-time fire service is limited and where long access routes make it impossible to achieve shorter travel times.

**Finding:** Project documentation and agency recommendations have determined that the project meets or exceeds the requirements of this Significant Impact.

### 6.1.2 Access and Evacuation

The primary road providing emergency access and egress meets the minimum Fire Code width, paving and slope requirements between the project site and an intersection where two directions of egress travel is available.

There are no actual or potential bottlenecks or other constraints between the project site and the above referenced intersection.

Private roads and driveways will be provided with sufficient width to allow simultaneous passage of civilian vehicles and fire apparatus.

Fire Lanes established under the requirements of this Fire Protection Plan will be maintained in perpetuity according to the requirements of Section 22500.1 of the California Vehicle Code, allowing local law enforcement and fire officials the ability to enforce fire lane regulations without restrictions.

When met, the Fire Protection Plan provisions for Access and Evacuation will meet or exceed the Significant Impacts in this category.

### 6.1.3 – Water Supply

The Project will be served by the Padre Dam Municipal Water District.

The Alpine Fire Marshal has required that a minimum of five (5) new fire hydrants be installed at the Project Site with the capability of flowing a minimum fire flow of 2500 gallons per minute.

The Fire Protection Plan has recommended two options for installation of proposed fire hydrants.

Option 1 proposes seven (7) fire hydrants, to be placed at all cul-de-sac bulbs, intersections and at 300-foot spacing intervals along roadways. This recommendation provides optimal hydrant spacing and firefighting hose lay operations for non-rural settings.

Option 2 proposes five (5) fire hydrants, to be placed at all cul-de-sac bulbs, intersections and at 500-foot spacing intervals along roadways. This recommendations coincides with the Alpine Fire Marshal's requirements and provides for effective rural and semi-rural firefighting needs.

#### **6.1.4 – Ignition Resistant Construction**

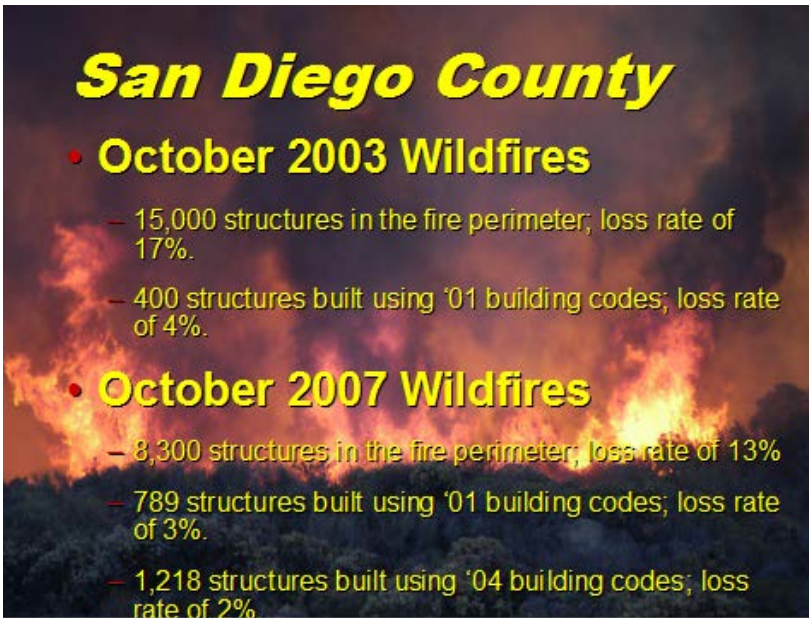
All new buildings and structures erected on the project site will be required to meet the County of San Diego Building Code Chapter 7-A requirements for Wildland Urban Interface Areas and Chapter 7-A requirements of the California Building Code. These requirements mandate the installation of automatic fire sprinkler systems compliant with NFPA Pamphlet 13-D *Installation of Automatic Fire Sprinklers in One and Two Family Dwellings* standards.

Roof composition is an important factor in structural survivability.

One study shows that typical single family dwellings with non-combustible roofs and thirty-three (33) to sixty-six feet of fuel clearance have a 95% chance of survival (Howard, et.al.,1973). A second study in Santa Barbara counted revealed that houses with a non-combustible roof and thirty-three to sixty feet of vegetation clearance had an 86% chance of survival (Foote, 1994).

The proposed single family dwellings in the project will be required to have Class A non-combustible roof decks or assemblies.





The above Power Point slide, from a presentation given by the San Diego County DPLU Fire Marshal's Office, indicates a 96 to 98% survivability rate for buildings erected under Enhanced Fire Resistant Construction/Chapter 7A and 7B requirements during actual, extreme fire behavior conditions in similar and more hazardous vegetation types than found on the project site.

The building standards proposed by this Fire Protection Plan will provide a reasonable degree of ignition resistant buildings at the project site and reduce the Significant Impact caused by less resistant construction standards.

#### **6.1.5 Defensible Space and Fuel Modifications**

Fire behavior, under these mitigation strategies, is expected to significantly diminish when a wildfire encroaches upon the Fuel Modification Zones on the property line exposed to off-site unmanaged vegetative fuels. Vegetation management beyond a structure's immediate vicinity has little effect on house ignitions unless a minimal break of continuous surface fuels is maintained around the perimeter of the house. For this reason, home site protection includes eliminating continuous ground fuels that lead

from wild land fuel beds to the house. This can be accomplished with rock landscaping, cement sidewalk, green grass or by removing dried vegetation and tree needles (Jack Cohen, USFS).

In 1997, Cohen conducted full-scale experiments that revealed that a typical Type V-B combustible wall thirty-three feet from a crown fire in 43 foot (13 meter) tall Black Spruce trees. These fires produced flame heights of 20 meters or 65.616 feet. Twenty-meter-long flame heights are produced by a 100 megawatt fire. The walls on the test site only ignited when actually touched by flames. These full-scale fire tests are the basis for the 100-foot-wide Fuel Modification Zones mandated by the County of San Diego.

The off-site Coastal Sage shrub environment on the north and west sides of the project will produce a 3.5502631035 megawatt fire. This heat energy release rate is approximately 3% of the energy produced by Cohen's full scale test fires.

The BEHAVE Fire Modeling calculation for the Project Site indicate that a wild fire moving through Fuel Model 1-GR-1 native and invasive species annual grasses will produce a Fire Line Intensity of 2868 BTU/foot/second. This value can be anecdotally applied to irrigated lawns and used to determine ignition times for residential construction materials by using various formulas and tables.

For example, using the formula:

$$t_{ig} = \pi \text{ kpc } (T_{ig} - T_o) / 2q_e \quad (\text{National Fire Academy Fire Dynamics pg. 5-3})$$

where

$t_{ig}$  = time to ignition, seconds

kpc = thermal inertia of material

$T_{ig}$  = temperature of ignition source

$T_o$  = surface temperature of exposed material

$q_e$  = incident heat flux to the material

The ignition time of solid materials can be estimated.

For a gypsum based one-hour fire resistive or non-combustible stucco plaster wall (as required by Chapter 7A of the County and California Building Codes) with a surface temperature of 100 degrees (solar exposure), having a kpc of  $5.8 \times 10^5 q_e$  (*Fire Dynamics*, pg. 2-15), exposed to radiative heat from a 1400-degree flame front thirty feet (30') away producing 2868 BTUs (fire line intensity of 18,124 BTU/ft./second), ignition time would be 3677.770911 seconds or **10.21603031 hours**.

The BEHAVE Fire Modeling Calculation indicates that non-irrigated Fuel Model 1/GR-1 light fuels under worst case 2003 Cedar Fire Event burning conditions will produce 2868 BTUs, equivalent to 840.324 watts or **.840324 kilowatts**.

Referring to *Fire Dynamics* Figure 2-5 *Damage Caused by Radiation* below, the calculated fire crossing into the TMP 21192 Project Site from the adjacent properties, with the potential ignition of landscaped lawns, will not produce sufficient radiant heat to cause significant damage of proposed new single family dwellings.

Damage Description	Heat Flux – kW/m <sup>2</sup>
Skin burns	4.7 to 5.0
Pain threshold	1.5
Pain at one minute	2.1
Plastic melts	12.0
Cable insulation degrades	18.0 to 20.0
<b><i>Piloted ignition occurs:</i></b>	
<b>Wood</b>	<b>14.6</b>
<b>Painted Wood</b>	<b>16.7</b>
<b>Wood spontaneously ignites</b>	<b>33.5</b>

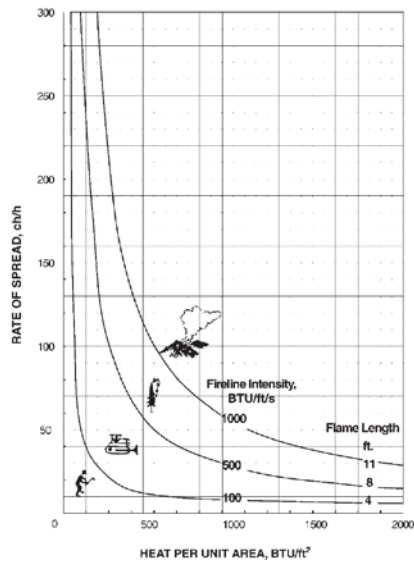
Type of Heat Exposure	Heat Flux Value
Flame Radiation	0-200 kW/m <sup>2</sup>
Flame Convection	10-20 kW/m <sup>2</sup>
Hot Gas Convection	0-10 kW/m <sup>2</sup>
Hot Gas Radiation	0-150 kW/m <sup>2</sup>

*Table 5.5 Heat Flux Direct Contact Values, NFA Fire Dynamics*

While Fuel Model SH-5 and SH-7 (Coastal Sage shrub) vegetation produce relatively long flame lengths (41.3' for SH-5 and 38' for SH-7) and higher burning intensities (2955 BTU/sq.ft. [SH-7] and 22335 BTU/sq.ft. [SH-5]), fire behavior will change when the flame front transitions into the irrigated grass fuel bed.

Irrigated lawns, as proposed as part of the defensible space guidelines for the project, will have a fuel moisture content of at least 120%. Fuel moisture contents of 120% result in green, non-cured vegetation, with all herbaceous materials remaining in the "live" fuel categories. As a result, grassy fuels with high fuel moistures will produce flame lengths of one (1') or less and have a rate of spread of approximately 5 chains (330 feet) per hour when exposed to a 20 m.p.h. mid-flame wind

The fire behavior characteristics of irrigated grass fuels is well within the capabilities of fire suppression forces using non-mechanized firefighting tools to control fires in this vegetation type. The change of burning characteristics and intensity as fire moves across the grassy fuels will provide more opportunities for responding resources to take defensive suppression action at the established Fuel Modification Zones around the TPM 21192 structures (see the Fire Behavior Characteristics Chart below).



## **CONCLUSIONS:**

This fire protection plan demonstrates compliance with the applicable regulations. It will ensure adequate compliance with codes/regulations and significance standards, including required fuel modifications and construction resistive materials. In addition, it can be incorporated by reference into the project's Final Conditions of Approval and enforced through each proposed structure's Certificate of Occupancy Conditions.

## **CHAPTER 7**

### **LIST OF PREPARERS AND PERSONS AND ORGANIZATIONS CONTACTED**

#### **Preparer(s)**

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San Diego, CA 92123  
858-974-5999

Padre Dam Municipal Water District  
9300 Fanita Parkway  
Santee, CA 92071  
619-448-3111

## CHAPTER 8 REFERENCES

*Alpine Community Protection and Evacuation Plan*, Version 1.1, 2006

### **National Wildfire Coordinating Group Publications:**

*Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model*, General Technical Report RMRS-GTR-153. June 2005. Joe H. Scott, Robert E. Burgan, United States Department of Agriculture - Forest Service, Rocky Mountain Research Station, Missoula, Montana.

*BEHAVE PLUS: Fire Modeling System Version 5.0.3* April 5, 2010. Patricia L. Andrews, United States Department of Agriculture - Forest Service, Rocky Mountain Research Station – Fire Sciences Lab, Missoula, Montana and Collin D. Bevins, System for Environmental Management, PO Box 8868, Missoula, Montana, 59807. Web site: <http://fire.org/>

National Wildfire Coordinating Group - *S-290 Intermediate Fire Behavior Manual*

National Wildfire Coordinating Group – *S-390 Introduction to Wildfire Calculations Manual*

*Aids to Determining Fuel Models for Estimating Fire Behavior*, Hal E. Anderson, United States Department of Agriculture Forest Service Intermountain Forest and Range Experiment Station General Technical Report INT-122, April 1982

*Physics-Based Modeling for WUI Fire Spread – Simplified Model Algorithm for Ignition of Structures by Burning Vegetation*, USDA Fire Research Division, NISTIR 7179

### **NFPA Publications:**



National Fire Protection Association - NFPA 13-D, *Standard for the Installation of Sprinkler Systems in One – and Two-Family Dwellings and Manufactured Homes*, 2010 and 2013 Editions.

National Fire Protection Association - NFPA 1142 *Standard on Water Supplies for Suburban and Rural Fire Fighting*, 2012 Edition.

National Fire Protection Association - NFPA 1144 *Standard for Reducing Structure Ignition Hazards from Wildfire* (2008).

National Fire Protection Association - NFPA 1142, 2008 Edition. Table C.11 (b) Time-Distance Table Using an Average Speed of 35 mph.

National Fire Protection Association Pamphlet 299 *Protection of Life and Property from Wildfire*

### **State of California Regulatory Documents**

California Code of Regulations, Title 14, section 1280 and Title 24 Part 9

California Public Resources Codes sections 4201 through 4204

California Government Code, sections 51175 through 51189.

2013 California Fire Code, CCR Title 24 Part 9, including Local Amendments and Appendices to Chapters 1 & 4 and Appendices B, F & H

*The California State and Local Responsibility Area Fire Hazard Severity Zone Map.*  
California Code of Regulations, Title 24, Part 2 - 2013 *California Building Code*

### **Local Ordinances**

County of San Diego Fire Code

San Diego County Consolidated Fire Code

Alpine Fire Protection District Ordinance 2013-01

**APPENDIX A**  
**COUNTY OF SAN DIEGO APPROVED PLANT LISTS**

TM5431 ALPINE 21 TENTATIVE MAP FIRE PROTECTION PLAN

# SUGGESTED PLANT LIST FOR A DEFENSIBLE SPACE

BOTANICAL NAME	COMMON NAME	Climate Zone
<b>TREES</b>		
Acer		
platanoides	Norway Maple	M
rubrum	Red Maple	M
saccharinum	Silver Maple	M
saccarum	Sugar Maple	M
macrophyllum	Big Leaf Maple	C/ (R)
Alnus rhombifolia	White Alder	C/I/M (R)
Arbutus		
unedo	Strawberry Tree	All zones
Archontophoenix		
cunninghamiana	King Palm	C
Arctostaphylos spp.**	Manzanita	C/I/D
Brahea		
armata	Blue Hesper Palm	C/D
edulis	Guadalupe Palm	C/D
Ceratonia siliqua	Carob	C/I/D
Cercidium floridum	Blue Palo Verde	D
Cercis occidentalis**	Western Redbud	C/I/M
Cornus		
nuttallii	Mountain Dogwood	I/M
stolonifera	Redtwig Dogwood	I/M
Eriobotrya		
japonica	Loquat	C
Erythrina caffra	Kaffirboom Coral Tree	I/M
Ginkgo biloba "Fairmount"	Fairmount Maidenhair Tree	I/D/M
Gleditsia triacanthos	Honey Locust	
Juglans		I
californica	California Walnut	C/I
hindsii	California Black Walnut	I/D/M
Lagerstroemia indica	Crape Myrtle	I
Ligustrum lucidum	Glossy Privet	C/I/M
Liquidambar styraciflua	Sweet Gum	I
Liriodendron tulipifera	Tulip Tree	
Lyonothamnus floribundus		C
ssp. Asplenifolius	Fernleaf Catalina Ironwood	C/I/D
Melaleuca spp.	Melaleuca	C/I
Parkinsonia aculeate	Mexican Palo Verde	
Pistacia		
chinensis	Chinese Pistache	
	Pistachio Nut	C/I/D

vera	Pistachio Nut	I
Pittosporum		
phillyraeoides	Willow Pittosporum	C/I/D
viridiflorum	Cape Pittosporum	C/I
Platanus		
acerifolia	London Plane Tree	All zones
racemosa**	California Sycamore	C/I/M
Populus		
alba	White Poplar	D/M
fremontii**	Western Cottonwood	I
trichocarpa	Black Cottonwood	I/M
Prunus		
xblireiana	Flowering Plum	M
caroliniana	Carolina Laurel Cherry	C
ilicifolia**	Hollyleaf Cherry	C
lyonii**	Catalina Cherry	C
serrulata 'Kwanzan'	Flowering Cherry	M
yedoensis 'Akebono'	Akebono Flowering Cherry	M
Quercus		
agrifolia**	Coast Live Oak	C/I
engelmannii	Engelmann Oak	I
**  suber	Cork Oak	C/I/D
Rhus		
lancea**	African Sumac	C/I/D
Salix spp.**	Willow	All zones (R)
Tristania conferta	Brisbane Box	C/I
Ulmus		
parvifolia	Chinese Elm	I/D
pumila	Siberian Elm	C/M
Umbellularia californica**	California Bay Laurel	C/I

SHRUBS		
Agave	Century Plant	D
americana	Century Plant	D
deserti	Shawis Century Plant	D
shawii**		
Amorpha fruticosa**	False Indigobush	I
Arbutus		
menziesii**	Madrone	C/I
Arctostaphylos spp.**	Manzanita	C/I/D
Atriplex**		
canescens	Hoary Saltbush	I
lentiformis	Quail Saltbush	D
Baccharis**		
glutinosa	Mule Fat	C/I
pilularis	Coyote Bush	C/I/D
Carissa grandiflora	Natal Plum	C/I
Ceanothus spp.**	California Lilac	C/I/M
Cistus spp.	Rockrose	C/I/D
Cneoridium dumosum**	Bushrue	C
Comarostaphylis**		
diversifolia	Summer Holly	C
Convolvulus cheorum	Bush Morning Glory	C/I/M
Dalea		
orcuttii	Orcutt's Delea	D
spinosa**	Smoke Tree	I/D
Elaeagnus		
pungens	Silverberry	C/I/M
Encelia**		
californica	Coast Sunflower	C/I
farinosa	White Brittlebush	D/I
Eriobotrya		
deflexa	Bronze Loquat	C/I
Eriophyllum		
confertiflorum**	Golden Yarrow	C/I
staechadifolium	Lizard Tail	C
Escallonia spp.	Escallonia	C/I
Feijoa sellowiana	Pineapple Guava	C/I/D
Fouquieria splendens	Ocotillo	D
Fremontodendron**		
californicum	Flannelbush	I/M
mexicanum	Southern Flannelbush	I
Galvezia		
juncea	Baja Bush-Snapdragon	C
speciosa	Island Bush-Snapdragon	C
Garrya		
elliptica	Coast Silktassel	C/I
flavescens**	Ashy Silktassel	I/M

Salvia spp.**	California Wild Rose	C/I
Sambucus spp.**	Baja California Wild Rose	C/I
Symphoricarpos mollis**	Sage	All Zones
Syringa vulgaris	Elderberry	C/I/M
Tecomaria capensis	Creeping Snowberry	C/I
Teucrium fruticans	Lilac	M
Toxicodendron**	Cape Honeysuckle	C/I/D
diversilobum	Bush Germander	C/I
Verbena		
lilacina	Poison Oak	I/M
Xylosma congestum		
Yucca**	Lilac Verbena	C
schidigera	Shiny Xylosma	C/I
whipplei		
	Mojave Yucca	D
	Foothill Yucca	I

<b>VINES</b>		
Antigonon leptopus	San Miguel Coral Vine	C/I
Distictis buccinatoria	Blood-Red Trumpet Vine	C/I/D
Keckiella cordifolia**	Heart-Leaved Penstemon	C/I
Lonicera		
japonica 'Halliana'	Hall's Honeysuckle	All Zones
subspicata**	Chaparral Honeysuckle	C/I
Solanum		
jasminoides	Potato Vine	C/I/D

<b>PERENNIALS</b>		
Coreopsis		
gigantea	Giant Coreopsis	C
grandiflora	Coreopsis	All Zones
maritime	Sea Dahlia	C
verticillata	Coreopsis	C/I
Heuchera maxima	Island Coral Bells	C/I
Iris douglasiana**	Douglas Iris	C/M
Iva hayesiana**	Poverty Weed	C/I
Kniphofia uvaria	Red-Hot Poker	C/M
Lavandula spp.	Lavender	All Zones
Limonium californicum		
var. mexicanum	Coastal Statice	C
perezii	Sea Lavender	C/I
Oenothera spp.	Primrose	C/I/M
Penstemon spp.**	Penstemon	C/I/D
Satureja douglasii	Yerba Buena	C/I
Sisyrinchium		
bellum	Blue-Eyed Grass	C/I
californicum	Golden-Eyed Grass	C
Solanum		
xanthii	Purple Nightshade	C/I
Zauschneria**		
californica	California Fuschia	C/I
cana	Hoary California Fuschia	C/I
'Catalina'	Catalina Fuschia	C/I

<b>ANNUALS</b>		
Lupinus spp.**	Lupine	C/I/M





### 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.

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

## **APPENDIX B FIRE CODE MINIMUM ACCESS ROAD REQUIREMENTS**

All roadways serving this Project shall be a minimum of twenty-four (24) feet improved paved width. Private driveways shall have a minimum improved paved width of sixteen (16') feet.

All roads and driveways shall not exceed 20% grades. Any road or driveway between 15 and 20 percent will be a concrete surface and have a deep broom finish perpendicular to the direction of travel to enhance traction.

All dead-end roads (including driveways) in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus.

All roads within the development shall be all-weather paved streets capable of supporting fire apparatus weighing up to 75,000 pounds.

All roads shall be provided with the approved paved driving surface prior to construction and/or bringing combustible building products onto each parcel.

Gates Across Roads - There are no entrance gates planned for this residential development. If in the future or at a later date a gate is, the following shall be required:

- Gates shall be automatic
- Gates shall be equipped with approved emergency key-operated switches that overrides all gate command functions and opens the gate(s).
- Gates shall also be equipped with approved emergency tract control-activating strobe light sensor(s) or other devices approved by the Alpine FPD Chief, which will activate the gate on the approach of emergency apparatus.
- Gate opening mechanisms shall be provided with battery back-up or manual mechanical disconnects in the event of power failures.
- Gates shall conform to Alpine FPD requirements and County design requirements DS-17, 18, and 19.

Roads having improved paved width less than thirty-six (36') feet shall be designated Fire Apparatus Access Roads (Fire Lanes). Fire Lanes shall be identified by:

- Red curbs with white stenciled letters plainly visible from a vehicle

- White stenciled letters on red curbs shall state “Fire Lane-No Parking” Fire Lane signs posted in compliance with Section 22500.1 of the California Vehicle Code



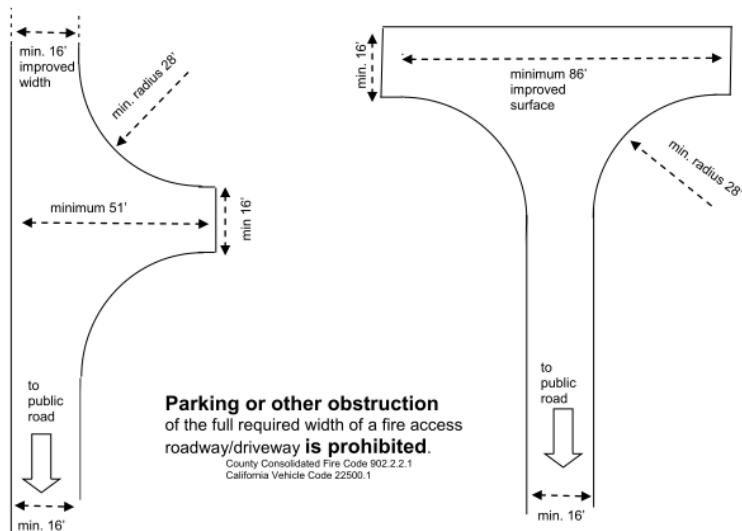
## SAN DIEGO COUNTY FIRE AUTHORITY

5510 OVERLAND AVE., SUITE 250, SAN DIEGO, CA 92123 • (858) 974-5999

### Emergency Vehicle Turnaround

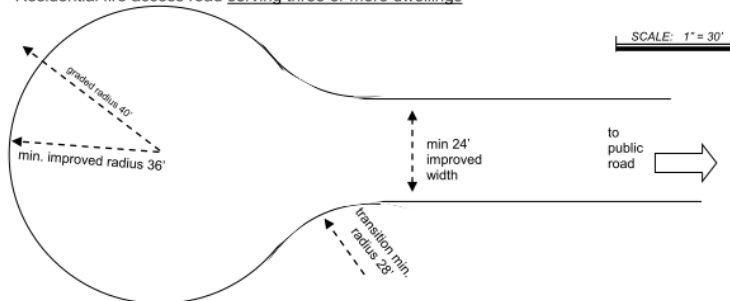
#### Hammerhead Turnaround

Residential fire access road/driveway serving no more than two dwellings



#### Cul-de-sac Turnaround

Residential fire access road serving three or more dwellings





## SAN DIEGO COUNTY FIRE AUTHORITY

5510 OVERLAND AVE., SUITE 250, SAN DIEGO, CA 92123 • (858) 974-5999

### Emergency Vehicle Turnaround

#### Code Excerpts:

#### SECTION 503 FIRE APPARATUS ACCESS ROADS

**Sec. 503.1 General.** Fire apparatus access roads, including private residential driveways, shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from the closest point of fire department vehicle access.

Fire apparatus access roads, except private residential driveways, shall be provided and maintained for purposes of rapid and reliable fire apparatus access and for unobstructed traffic circulation for evacuation or relocation of civilians during a wildfire or other emergency.

Fire apparatus access roads shall be provided and maintained in compliance with this section and the most recent edition and any amendments thereto, of public and private road standards as adopted by the County of San Diego (San Diego County Standards for Private Roads and Public Roads, San Diego County Department of Public Works). The fire code official may modify the requirements of this section if the modification provides equivalent access.

**Sec. 503.2.1 Dimensions.** The dimensions of fire apparatus access roads shall be in accordance with the following:

- (a) Fire apparatus access roads shall have an unobstructed improved width of not less than 24 feet, except for single-family residential driveways serving no more than two single-family dwellings, which shall have a minimum of 16 feet of unobstructed improved width. Any of the following, which have separated lanes of one-way traffic: gated entrances with card readers, guard stations or center medians, are allowed, provided that each lane is not less than 14 feet wide.
- (b) Fire apparatus access roads that are public or private roads which are provided or improved as a result of a Tentative Map, Tentative Parcel Map or a Major/Minor Use Permit shall have the dimensions as set forth by the County of San Diego Standards for Public and Private Roads.
- (c) All fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches.
- (d) Vertical clearances or road widths shall be increased when the fire code official determines that vertical clearances or road widths are not adequate to provide fire apparatus access.
- (e) Vertical clearances or road width may be reduced when the fire code official determines the reduction does not impair access by fire apparatus. In cases where the vertical clearance has been reduced, approved signs shall be installed and maintained indicating the amount of vertical clearance.

**Sec. 503.2.3 Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus (not less than 75,000 lbs. unless authorized by the FAHJ) and shall be provided with an approved surface so as to provide all-weather driving capabilities. The paving and sub-base shall be installed to the standards specified in the County of San Diego Parking Design Manual.

**Sec. 503.2.4 Roadway radius.** The horizontal inside radius of a fire apparatus access road shall comply with the County public and private road standards approved by the Board of Supervisors. The horizontal inside radius for a private residential driveway shall be a minimum of 28 feet, as measured on the inside edge of the improvement width or as approved by the fire code official. The length of vertical curves of fire apparatus access roads shall be less than 100 feet, or as approved by the fire code official.

**Sec. 503.2.5 Dead ends.** All dead-end fire access roads in excess of 150 feet in length shall be provided with approved provisions for turning around emergency apparatus. A cul-de-sac shall be provided in residential areas where the access roadway serves more than 2 structures. The minimum unobstructed radius width for a cul-de-sac in a residential area shall be 36 feet paved, 40 feet graded, or as approved by the fire code official. The fire code official shall establish a policy identifying acceptable turnarounds for various project types.

**Sec. 503.2.8 Roadway Turnouts.** When required by the fire code official, turnouts shall be a minimum of 12 feet wide and 30 feet long with a minimum 25 foot taper on each end.

## **APPENDIX C**

### **IGNITION RESISTANT CONSTRUCTION & FIRE PROTECTION SYSTEMS**

Several pre-cautionary ignition-resistant construction measures will be used to reduce potential ignition of residences from wild land fires firebrands.

All structures shall be built with Class A Roof Assemblies, including a Class A roof covering.

The exterior wall surface materials shall be non-combustible, or an approved alternate, and shall be protected by two inch nominal solid blocking between rafters all roof overhangs or by stucco boxed-in eaves.

Attic or foundation ventilation louvers or ventilation openings shall not exceed 144 square inches per opening. The vent openings shall be covered with corrosion-resistant metal mesh screening or other approved material that offers equivalent protection. Grid openings in the mesh screen shall have a minimum dimension of 1/16<sup>th</sup> inch and shall not exceed 1/8<sup>th</sup> inch. Attic ventilation shall also comply with the requirements of the California Building Code (C.B.C.). Attic ventilation openings or ventilation louvers in soffits, eave overhangs, between rafters at eaves, or in other overhanging areas shall not be permitted.

Paper-faced insulation shall be prohibited in attics or ventilated spaces.

All chimney, flue or stovepipe openings will have an approved spark arrester. Spark arrestors shall be installed to be visible for the purposes of inspection and maintenance.

Glass or other transparent, translucent or opaque glazing, including skylights, shall be constructed of tempered glass or multi-layered panels with at least one tempered pane or glass block construction. Exterior glazing shall have a minimum fire-resistance rating of not less than 20 minutes.

All residential structures will have automatic interior fire sprinklers installed according to the National Fire Protection Association (NFPA) 13D-*Standard for the Installation of Automatic Fire Sprinklers in One- and Two-family Homes and Manufactured Homes* and Alpine Fire Protection District standards.



Rain gutters, down spouts and gutter hardware will be constructed from metal or other approved non-combustible material. Gutters will be designed to reduce the accumulation of leaf litter and debris.

The first five feet of fences and other construction (gates, gate posts, fence posts) attached to structures shall be of non-combustible material.

All projections (patio covers, unenclosed roofs and floors, and similar architectural appendages and projections) will be of non-combustible construction, one-hour fire resistive construction on the underside, or heavy timber construction. When such appendages and projections are attached to exterior fire-resistive walls, they will be constructed to maintain the fire-resistive integrity of the wall.

Exterior balconies and decks will be of non-combustible construction, one-hour fire resistive construction on the underside, or heavy timber construction. Exterior decks shall be completely enclosed from the bottom of the deck surface to ground level and covered with approved non-combustible construction materials.

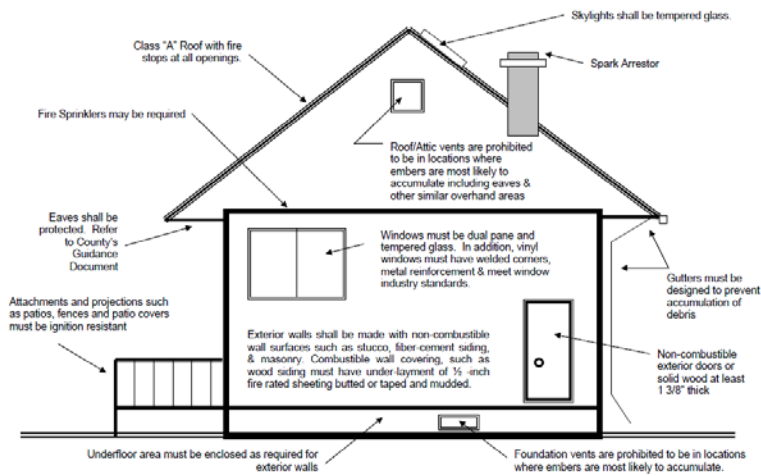
Exterior doors will be approved non-combustible construction, solid core wood not less than 1-3/8 inches thick (or equivalent) and have a fire resistive rating of not less than 20 minutes.

All openable windows will be provided with metal mesh or similar non-combustible screens to prevent embers from entering the structure during high wind conditions.

Any damaged or replacement window, siding, roof coverings, and other mitigation measures will meet or exceed the original intent of the fire protection discussed in this Plan.



County of San Diego, Department of Planning and Land Use  
**FIRE RESISTIVE CONSTRUCTION REQUIREMENTS**  
BUILDING DIVISION



DPLU #662 (5/08)

5201 RUFFIN ROAD, SUITE B, SAN DIEGO, CA 92123 • (619) 565-5920 • (800) 336-7563  
[HTTP://WWW.SDCDPLU.ORG](http://WWW.SDCDPLU.ORG)

TM5431 ALPINE 21 TENTATIVE MAP FIRE PROTECTION PLAN

1  
2  
0

## **APPENDIX D DEFENSIBLE SPACE AND VEGETATION**

### **Additional Zone 1 Fuel Modification Requirements**

All undesirable non-native vegetation (See APPENDIX A) will be removed and replanted with drought tolerant, fire resistant landscaping.

Vegetation may include single or cluster of trimmed fire resistant native and ornamental plants (oaks, sumac, toyon, SEE APPENDIX A.)

Dense plant masses adjacent to the structures and at bases of trees and tree clusters will not be placed in this Zone. Provide low growing, fire resistive, deep rooted, drought tolerant planting to maintain erosion control and soil stability, especially on manufactured slopes.

Native or ornamental trees to be retained within fuel modification zones shall be pruned to maintain a vertical separation of approximately ten (10) feet above underlying shrubs or groundcover. Pruning of the shrubs will minimize the impact of the tree pruning.

Trees and large shrubs over 15 feet in height (oaks, sumac, toyon, etc.) shall be pruned to provide clearance between plants of three (3) times the height of understory plants, or 10 feet, whichever is greater.

Trees may be planted and maintained as individual specimens, or clustered with no more than three (3) trees in a single cluster with a minimum distance between mature canopies of 20 feet. Avoid planting trees directly uphill of one another.

Tree canopies will not be allowed to overhang the roof of any structure; the outer edge of the canopies of mature trees will be a minimum of ten (10) feet from the building eaves, and free of all dead or dying parts.

All the dead material must be pruned out of all vegetation on an annual and as- needed basis by June 1<sup>st</sup> of each year.

Mature heights of new shrub plantings will be a maximum of 36 inches.

Zone 1 Defensible Space is an irrigated landscaping zone. This zone may be irrigated with micro-irrigation when overhead irrigation may cause erosion.

Firewood and combustible material shall not be stored within thirty (30') of buildings and structures, under unenclosed spaces beneath buildings or structures, or on decks or under eaves, canopies or other projections or overhangs.

Highly flammable plant species will be permanently removed from Zone 1 Defensible Space because of their susceptibility to wild land fire. Additionally, certain ornamental plants shall not be planted or allowed to become established within the Zone 1 Defensible Space unless otherwise specified as acceptable in the Recommended Plant List in Appendix A or as approved by the Fire Marshal.

#### **Additional Zone 2 Fuel Modification Requirements**

If shrubs are located underneath a tree's drip line, the lowest branch shall be at least three times as high as the under story shrubs or 10 feet, whichever is greater.

Large continuous masses of shrubs and understory less than 15 feet in height will be thinned to remove fuel and provide at least ten (10) feet between shrub masses, or individual shrubs. Thinning will reduce the overall canopy coverage of the area a minimum of fifty (50) percent.

Mulches, chips and other small multi-cuttings (cut to less than two inches in diameter and four inches in length) will only be evenly spread over the area no more than 6 inches at least 50 feet from structures. This can be used to prevent grass and weed encroachments within the treated areas. Mulching helps to maintain soil moisture for designated plants, reduces the growth of annual grasses, and minimizes soil erosion.

There is a very high probability that the openings will be dominated with non-native weed or grass species. Therefore, all grasses and weeds are to be mowed or weed-whipped to a four (4) inch stubble height by June 1<sup>st</sup> of each year or when the fuels become cured, whichever occurs first. Any vegetation biomass (debris and trimmings) produced by thinning and pruning shall be removed from the site or converted to mulch by chipping and evenly distributed to a maximum depth of four (4) inches and at kept at least 50 feet from a structure.

#### **Additional General Fuel Modification Measures**

Brush removal shall be completed prior to commencing any flammable construction.

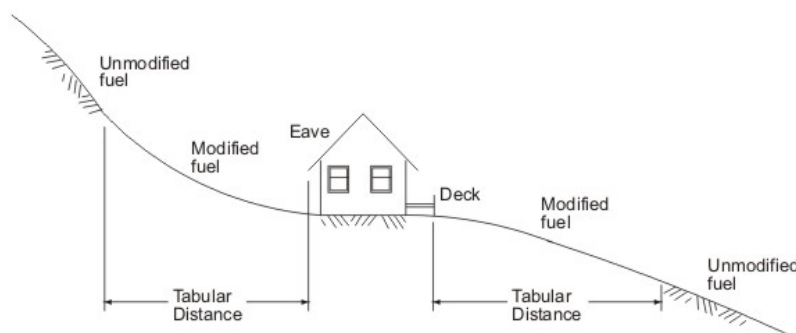
During construction at least 50 feet of clearance around the structures shall be free of all flammable vegetation as an interim fuel modification zone.

The annual completion of all designated Fuel Modification Treatments will occur prior to June 15<sup>th</sup>.

All individual landscaping plans, including additional structures, will comply with the Fire Protection Plan.

Trees and plants will be planted in accordance with the County of San Diego Approved Plants for Defensible Space in Fire Prone Areas List or as approved by the Alpine Fire Protection District.

Any disputes of yard landscaping regarding the interpretation of this Fire Protection Plan (FPP) will be decided by the Alpine Fire Marshal. The Fire Marshal's decision will be final and binding on the landowner.



Example of Fuel Modification Zone configuration for 100' depth between structure and unmodified fuel – “tabular distance” is the required lateral distance, without regard to distances produced by slope inclination or declination, from the edge of buildings to the unmanaged vegetative fuel bed.



TM5431 ALPINE 21 TENTATIVE MAP FIRE PROTECTION PLAN



***Northern Phase 1 Development Area Fuel Modification Zone Layout***



**Southern Phase 2 Development Area Fuel Modification Zone Layout**

**APPENDIX "E"**  
**ALPINE F.P.D. PROJECT FACILITY AVAILABILITY FORM 399-F**



County of San Diego, Planning & Development Services  
**PROJECT FACILITY AVAILABILITY - FIRE**  
**ZONING DIVISION**

**FIRE**  
**DEPT.**  
**726.421**

Please type or use pen

Alpine 21, LLC 310-415-1651  
Owner's Name Phone  
5855 Beachcomber Court  
Owner's Mailing Address Street  
San Diego CA 92130  
City State Zip

ORG \_\_\_\_\_  
ACCT \_\_\_\_\_  
ACT \_\_\_\_\_  
TASK \_\_\_\_\_  
DATE \_\_\_\_\_ AMT \$ \_\_\_\_\_

DISTRICT CASHIER'S USE ONLY

**SECTION 1. PROJECT DESCRIPTION TO BE COMPLETED BY APPLICANT**

A. ☐ Major Subdivision (TM) ☐ Specific Plan or Specific Plan Amendment  
☐ Minor Subdivision (TPM) ☐ Certificate of Compliance  
☐ Boundary Adjustment  
☐ Rezone (Reclassification) from \_\_\_\_\_ to \_\_\_\_\_ zone.  
☐ Major Use Permit (MUP), purpose: \_\_\_\_\_  
☐ Time Extension, Case No. \_\_\_\_\_  
☐ Expired Map, Case No. \_\_\_\_\_  
☐ Other: \_\_\_\_\_

B. ☒ Residential, Total number of dwelling units 22  
☐ Commercial, Gross floor area \_\_\_\_\_  
☐ Industrial, Gross floor area \_\_\_\_\_  
☐ Other, Gross floor area \_\_\_\_\_

C. Total Project acreage 83 Total lots 22 Smallest proposed lot 1 ac.

Assessor's Parcel Number(s) (add extra if necessary)  
403-160-11&15

Thomas Guide, Page 1234 Grid C-5  
Ely terminus of Country Meadows Rd.  
Project address Street  
Alpine 91901  
Community Planning Area/Subregion Zip

OWNER/APPLICANT AGREES TO COMPLETE ALL CONDITIONS REQUIRED BY THE DISTRICT.  
Applicant's Signature Danny L. ... Date: 4-15-16  
Address: 535 N. Highway 101, Suite A Solana Beach, Ca. 92075 Phone: 858-847-0011  
(On completion of above, present to the district that provides fire protection to complete Section 2 and 3 below.)

**SECTION 2: FACILITY AVAILABILITY TO BE COMPLETED BY DISTRICT**

District Name: ALPINE FIRE PROTECTION DISTRICT.  
Indicate the location and distance of the primary fire station that will serve the proposed project:  
Station 11, 1364 TAYLOR RD. IS 1.8 MILES SSW OF DEVELOPMENT.

A. ☒ Project is in the District and eligible for service.  
☐ Project is not in the District but is within its Sphere of Influence boundary, owner must apply for annexation.  
☐ Project is not in the District and not within its Sphere of Influence boundary.

B. ☒ Project is not located entirely within the District and a potential boundary issue exists with the \_\_\_\_\_ District.  
Based on the capacity and capability of the District's existing and planned facilities, fire protection facilities are currently adequate or will be adequate to serve the proposed project. The expected emergency travel time to the proposed project is 3.5 minutes.

C. ☐ Fire protection facilities are not expected to be adequate to serve the proposed development within the next five years.  
☒ District conditions are attached. Number of sheets attached \_\_\_\_\_  
☐ District will submit conditions at a later date.

**SECTION 3 FUELBREAK REQUIREMENTS**

Note: The fuelbreak requirements prescribed by the fire district for the proposed project do not authorize any clearing prior to project approval by Planning & Development Services.

☒ Within the proposed project 100' feet of clearing will be required around all structures.  
☐ The proposed project is located in a hazardous wildland fire area, and additional fuelbreak requirements may apply. Environmental mitigation requirements should be coordinated with the fire district to ensure that these requirements will not pose fire hazards. PDS-399F EXPIRES IN 1 YEAR 4-21-2017.

This Project Facility Availability Form is valid until final discretionary action is taken pursuant to the application for the proposed project or until it is withdrawn, unless a shorter expiration date is otherwise noted.

Authorized Signature Jason M. McBroon Print Name and Title JASON MCBROON FIRE MARSHAL Phone 445-2635 Date 4/21/2016  
On completion of Section 2 and 3 by the District, applicant is to submit this form with application to Planning & Development Services - Zoning Counter, 5510 Overland Ave., Suite 110, San Diego, CA 92123.

PDS-399F (Rev. 09/21/2012)

TM5431 ALPINE 21 TENTATIVE MAP FIRE PROTECTION PLAN

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**APPENDIX “F”**  
**ALPINE F.P.D. PROJECT CONDITIONS**



## ALPINE FIRE PROTECTION DISTRICT

Date: 4-20-2016

County of San Diego  
Planning and Development Services  
Zoning Counter  
5510 Overland Avenue Suite 110  
San Diego, CA 92123

Dept: Zoning

RE: APN: 403-160-11 & 15  
Project: Alpine -21  
Street Name: Country Meadows Road & Chelsea Leigh Way  
City, State, Zip: Alpine, Ca. 91901

The Fire District has received the Project Facility Availability Letter and determined that the following conditions shall apply:

1. **Road Dimensions:** All on site roadways shall have an unobstructed improved width of not less than 32' feet. Fire apparatus roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches. Parking will be permissible on one side of the road way only. Should developer wish to add parking on both sides of roadways total improved surface roadway shall be 40' wide all weather surface.
2. **Surface:** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus not less than 75, 000 lbs.
3. **Turning Radius:** The turning radius of a fire apparatus access road shall be a minimum of 36', as measured on the inside edge of the improvement width.
4. **Dead End Road Lengths:** Parcels zoned for less than 1 acre shall not exceed 800 feet without mitigation. Due to re-zoning, some subdivisions may exceed the dead end road lengths and the Fire District will take this into consideration.

Any residential driveway that is in excess of 150 feet in length shall be provided with approved provisions for turning around emergency apparatus. A cul-de-sac shall be provided in residential areas where the access roadway serves more than two structures. The minimum unobstructed paved radius width for a cul-de-sac shall be 36 feet radius in a residential area.

1364 Tavern Road Alpine, CA 91901-3831 Business: (619) 445-2635 Fax: (619) 445-2634

We are a public safety organization of dedicated professionals whose mission it is to:  
Save Lives, Protect Property and the Environment, Serve the Community  
[www.alpinefire.org](http://www.alpinefire.org)



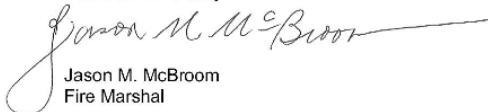
## ALPINE FIRE PROTECTION DISTRICT

**Markings:** Should developer wish to have parking on one side of the roadway the opposite side of roadway shall have notice of "NO PARKING SIGNS" installed every 30' and maintained as part of the road maintenance agreement.

6. **Roadway Design Features:** No speed bumps, speed humps, speed control dips, etc. shall be permitted on fire access roadway.
7. **Road Maintenance Agreement:** A road maintenance agreement shall be in place and recorded at the County of San Diego to provide continued road maintenance in perpetuity.
8. **Water Supply:** All new fire hydrants installed shall be installed as per PMWD installation standards. Fire flow shall be capable to deliver 2500 GPM. All new Fire hydrants shall also be installed with an approved break-off check valve spool. In areas that vehicular damage may occur. There shall be 5 fire hydrants installed in the proposed development, 1 at each cul-de-sac and 2 along roadways. I will confirm locations on plot plan.
9. **Fire Protection Systems:** All structures shall be equipped with residential fire sprinklers in accordance with the most recent edition of NFPA 13D.
11. **Vegetation Management:** Fuel modification zones shall be maintained to meet the requirements of the Alpine Fire Protection District. A minimum 100 foot defensible space is required or to property lines, whichever is closer. Brush management along roadways shall be maintained 30' of clearance at all times. NO combustible fuels shall be planted within the right of way along shoulders. All trees shall be limbed up 8' from the ground and maintained at all times. Parcels 5,6,7 and 11 shall have a full 100 of defensible space due to slope and terrain.
12. **Fire Protection Plan:** A full fire protection plan shall be required.
13. **Grade/Driveways:** The following driveways shall be installed with all concrete as the percent of the driveway exceeds 15%: Parcels 1,3,5 and 6.

If you should have questions or comments, feel free to contact me.

Yours in Fire Safety

  
Jason M. McBroom  
Fire Marshal

cc: James Pine, Deputy Fire Marshal, San Diego County Fire Authority

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TM5431 ALPINE 21 TENTATIVE MAP FIRE PROTECTION PLAN

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**APPENDIX “G”  
PADRE DAM MUNICIPAL WATER DISTRICT  
PROJECT CONDITIONS**





9300 Fanita Parkway, Santee  
619-258-4635

**WATER AVAILABILITY ATTACHMENT  
CONDITIONS OF APPROVAL**

PROJECT NAME Alpine 21, LLC FOR 22 Lot Subdivision MAP NUMBER \_\_\_\_\_

A.P.N.(s) 403-160-11, & 15

**FACILITIES**

Domestic/Irrigation service and fire hydrant requirements may determine if the proposed project will require a water main extension. If a water main extension is necessary, the following will be requirements to proceed with the project. The Developer / Property Owner shall:

- [ X ] Prepare plans for a Potable Water system according to Padre Dam's Requirements.
- [ X ] Provide the agreement and securities required by the County / City and/or Padre Dam to install the public water system required for the project.
- [ X ] Install a Potable Water System per the Padre Dam Rules and Regulations and Standard Specifications.
- [ X ] Pay for all installation and capacity fees for each meter connection, each lot, or each building. (As determined by project need prior to District providing service or an unconditional commitment letter)
- [ X ] Install private/public potable water, reclaimed water and sewer lines with the required separation as determined by the Health Department and Padre Dam.

Padre Dam does not require that all lots be connected to the public water system. Alternate sources of water are under the jurisdiction of the County of San Diego, or the City of Santee.

**EASEMENTS**

- [ X ] Developer shall dedicate to Padre Dam all necessary easements for that portion of the water system which is to be public.
- [ X ] Easements may be required by Padre Dam to allow for future main extensions to serve property beyond the boundaries of the map/project.

**FACILITY COMMITMENT**

- [ X ] Adequate water facility commitment shall be committed prior to final project approval/map recordation and shall be available concurrent with project need. Unconditional Facility Commitment form will be signed upon payment of capacity and meter fees.

**SPECIAL CONDITIONS**

- [ X ] Water Quality maintenance throughout this project will be a consideration that must be part of the water system design for this project. Onsite/offsite water line looping may be required.
- [ X ] A water main loop will be required from the existing 12 inch PVC water main at the south east end of the project to the phase 2 area of the subdivision.
- [ X ] The water main loop must be clear of open space with no restrictions.
- [ X ] A 12' paved road and 25' easement to Padre Dam MWD will be required for the water main loop.
- [ X ] There is a service limitation for fire hydrant locations at the end of the cul-de-sac on Country Meadows Road at a maximum elevation of 2160'.
- [ X ] The water main will be sized to meet the Fire Department's 2500 GPM fire flow requirement.

Approved by: Cheryl Brugman

Date: 5/6/2016

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**APPENDIX "H"  
BEHAVE FIRE MODELING CALCULATIONS**

TM5431 ALPINE 21 TENTATIVE MAP FIRE PROTECTION PLAN

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Inputs: SURFACE, SIZE, SPOT, IGNITE

Description

victoria ne drainage

Fuel/Vegetation, Surface/Understory

Fuel Model

SH5

Fuel/Vegetation, Overstory

Downwind Canopy Height

ft

8

Fuel Moisture

1-h Moisture

%

1

10-h Moisture

%

3

100-h Moisture

%

5

Live Herbaceous Moisture

%

30

Live Woody Moisture

%

50

Weather

20-ft Wind Speed (upslope)

mi/h

30

Wind Adjustment Factor

1.5

Air Temperature

oF

85

Fuel Shading from the Sun

%

0

Terrain

Slope Steepness

%

18

Ridge-to-Valley Elevation Difference

ft

140

Ridge-to-Valley Horizontal Distance

mi

1.147

Spotting Source Location

VB

Fire

Elapsed Time

h

1

victoria ne drainage		
Surface Rate of Spread (maximum)	442.4	ch/h
Heat per Unit Area	2235	Btu/ft2
Fireline Intensity	18124	Btu/ft/s
Flame Length	40.9	ft
Area	3282.9	ac
Perimeter	943	ch
Spot Dist from a Wind Driven Surface Fire	1.6	mi
Probability of Ignition from a Firebrand	100	%

Inputs: SURFACE, SIZE, SPOT, IGNITE

Description ➡ victoria CTR drainage

Fuel/Vegetation, Surface/Understory

Fuel Model ➡ SH5

Fuel/Vegetation, Overstory

Downwind Canopy Height ft ➡ 8

Fuel Moisture

1-h Moisture % ➡ 1

10-h Moisture % ➡ 3

100-h Moisture % ➡ 5

Live Herbaceous Moisture % ➡ 30

Live Woody Moisture % ➡ 50

Weather

20-ft Wind Speed (upslope) mi/h ➡ 30

Wind Adjustment Factor ➡ .5

Air Temperature oF ➡ 85

Fuel Shading from the Sun % ➡ 0

Terrain

Slope Steepness % ➡ 13

Ridge-to-Valley Elevation Difference ft ➡ 225

Ridge-to-Valley Horizontal Distance mi ➡ .25

Spotting Source Location ➡ VB

Fire

Elapsed Time h ➡ 1



## victoria CTR drainage

Surface Rate of Spread (maximum)	440.0 ch/h
Heat per Unit Area	2235 Btu/ft <sup>2</sup>
Fireline Intensity	18025 Btu/ft/s
Flame Length	40.8 ft
Area	3259.7 ac
Perimeter	938 ch
Spot Dist from a Wind Driven Surface Fire	1.6 mi
Probability of Ignition from a Firebrand	100 %

## Inputs: SURFACE, SIZE, SPOT, IGNITE

Description ➡ victoria se drainage

## Fuel/Vegetation, Surface/Understory

Fuel Model



SH5

## Fuel/Vegetation, Overstory

Downwind Canopy Height

ft



8

## Fuel Moisture

1-h Moisture

%



1

10-h Moisture

%



3

100-h Moisture

%



5

Live Herbaceous Moisture

%



30

Live Woody Moisture

%



50

## Weather

20-ft Wind Speed (upslope)

mi/h



30

Wind Adjustment Factor



.5

Air Temperature

oF



85

Fuel Shading from the Sun

%



0

## Terrain

Slope Steepness

%



15

Ridge-to-Valley Elevation Difference

ft



160

Ridge-to-Valley Horizontal Distance

mi



.16

Spotting Source Location



VB

## Fire

Elapsed Time

h




1



victoria se drainage

Surface Rate of Spread (maximum)	440.8	ch/h
Heat per Unit Area	2235	Btu/ft <sup>2</sup>
Fireline Intensity	18061	Btu/ft/s
Flame Length	40.9	ft
Area	3268.1	ac
Perimeter	940	ch
Spot Dist from a Wind Driven Surface Fire	1.6	mi
Probability of Ignition from a Firebrand	100	%

## Inputs: SURFACE, SIZE, SPOT, IGNITE

Description  victoria center bowl

## Fuel/Vegetation, Surface/Understory

Fuel Model  SH5


## Fuel/Vegetation, Overstory

Downwind Canopy Height ft  8



## Fuel Moisture

1-h Moisture %  110-h Moisture %  3100-h Moisture %  5Live Herbaceous Moisture %  30Live Woody Moisture %  50


## Weather

20-ft Wind Speed (upslope) mi/h  30Wind Adjustment Factor  .5Air Temperature oF  85Fuel Shading from the Sun %  0

## Terrain

Slope Steepness %  10Ridge-to-Valley Elevation Difference ft  100Ridge-to-Valley Horizontal Distance mi  .09Spotting Source Location  VB

## Fire

Elapsed Time h  1





## victoria center bowl

Surface Rate of Spread (maximum)	438.9	ch/h
Heat per Unit Area	2235	Btu/ft <sup>2</sup>
Fireline Intensity	17981	Btu/ft/s
Flame Length	40.8	ft
Area	3249.4	ac
Perimeter	936	ch
Spot Dist from a Wind Driven Surface Fire	1.6	mi
Probability of Ignition from a Firebrand	100	%