

E.1.15 Fire and Fuels Management

A fireshed approach to analysis is taken in this section. Firesheds are regional landscapes that are delineated based on fire history, fire regime, vegetation, topography, and potential wildfire behavior. Firesheds are useful assessment tools for identifying high fire risk areas and predicting future fire behavior with the objective of reducing fire risk and protecting communities. Fire and fuels impacts are analyzed using supporting information and fire behavior model results for each fireshed as defined in Section D.15.2. Section D.15.4.3 provides an explanation of how fireshed boundaries were delineated and presents a detailed description of the computer models and data inputs, and Appendices 3A and 3B present detailed information on field data collection techniques and data coding protocols.

Firesheds along the Interstate 8 Alternative route are described in Section E.1.15.1, below. Figure D.15-2 (in Section D.15 Fire and Fuels Management) shows the boundaries of the firesheds along the Proposed Project and alternative project routes. The impact analyses and conclusions in Section E.1.15.2, below, summarize the results of fireshed modeling. Section E.1.15.3 presents modeling results, environmental impacts, and mitigation measures for five Interstate 8 route options. The environmental setting presented in Section E.1.15.1, below, is applicable to these route options and alternative substation. Section E.1.15.4 presents the environmental setting, environmental impacts, and mitigation measures for the Future Transmission System Expansion for the Interstate 8 Alternative.

E.1.15.1 Environmental Setting

Description of the environmental setting for the Interstate 8 Alternative route east of MP I8-31 was not included in this wildfire analysis due to the low fuel loads and arid climate that present a low risk of fire. Sections of the alternative routes that would cross through urban areas are also not described due to low wildfire risk in areas devoid of wildland fuels.

The western 25.6 miles of the Interstate 8 Alternative pass through 7 firesheds: 5 Alternative Route Firesheds (described below), and 2 Proposed Project Firesheds (described in Sections D.15.2.7 and D.15.2.8). Figure E.1.15-1 shows the Interstate 8 Alternative route and the boundaries of the firesheds through which it passes.

Boulevard Fireshed (AFS-1)

Total assessment area: 72,838 acres

The Boulevard Fireshed encompasses the southeastern-most corner of San Diego County and contains the easternmost portion of the I-8 alternative route. A total of 14.4 miles of overhead Interstate 8 Alternative transmission corridor and 6.4 miles of overhead BCD Alternative transmission corridor would pass through this fireshed (for a description of the BCD Alternative, see Section E.2.15). The fireshed contains the towns of Jacumba, Manzanita, and Boulevard which are all federally designated communities at risk of wildfire. Located in the fireshed are the Jacumba Mountains and the In-Ko-Pah Mountains, which is a BLM Area of Critical Environmental Concern. The wilderness areas in the southernmost portion of ABDSP are also within the fireshed boundary. The elevation ranges from 1,640 feet on the desert floor to 3,880 feet in Boulevard to 4,647 feet on Mt. Tule in the In-Ko-Pah Mountains. This fireshed has an average annual rainfall range between eight and 14 inches per year.

Consequently, much of the area is dominated by sparse, semi-arid vegetation which is often interspersed with granitic boulder outcroppings.

The Boulevard Fireshed is primarily composed of private lands, BLM land, and ABDSP land. Table E.1.15-1 presents a land ownership summary of the Boulevard Fireshed. The private lands are primarily clustered around Interstate 8 and south to the U.S.-Mexico border. The average parcel size is 20 acres, which indicates that there is development potential within the private lands. The population density within the private lands is 34 people per square mile. Potential future population growth within the Boulevard Fireshed will be concentrated in these private landholdings, increasing the human influence on the surrounding wildlands and thereby expanding the Wildland-Urban Interface (WUI). This fireshed is categorized as an Intermix WUI.¹ Intermix WUI areas have an elevated risk of wildfires due to the intermediate scale of development that has fragmented the wildlands, but not enough to disrupt the spread of wildfires (Syphard et al., 2007). In other words, wildlands are sufficiently contiguous to provide continuous fuels, which makes this fireshed prone to large fires. Because development is interspersed so extensively with wildland areas, human ignitions are more frequent, and fires sweeping through this fireshed have a high potential to be damaging to the intermixed community. The intermixed community is developed at a relatively low density (28-250 persons/square mile) compared with Interface WUI communities (250+ persons/square mile; see Section D.15.2.7, Ramona Fireshed, for a description of an Interface WUI).

Table E.1.15-1. Land Ownership Summary of Boulevard Fireshed

Ownership	Acres	Portion of Fireshed
City of SD	0	0%
County of SD	130	<1%
BLM	26,349	36%
USFS	0	0%
Military	0	0%
Native American Reservation	644	1%
State of CA	15,601	21%
SDG&E	2	<1%
Other (private, etc.)	29,970	41%
Total	72,696	100%

Source: Forester's Co-Op Fire Atlas Data.

Fire History

Fire frequency: 29 recorded fires/50 yrs.

Extended attack between 500 – 1,000 acres: 3 fires/50 yrs.

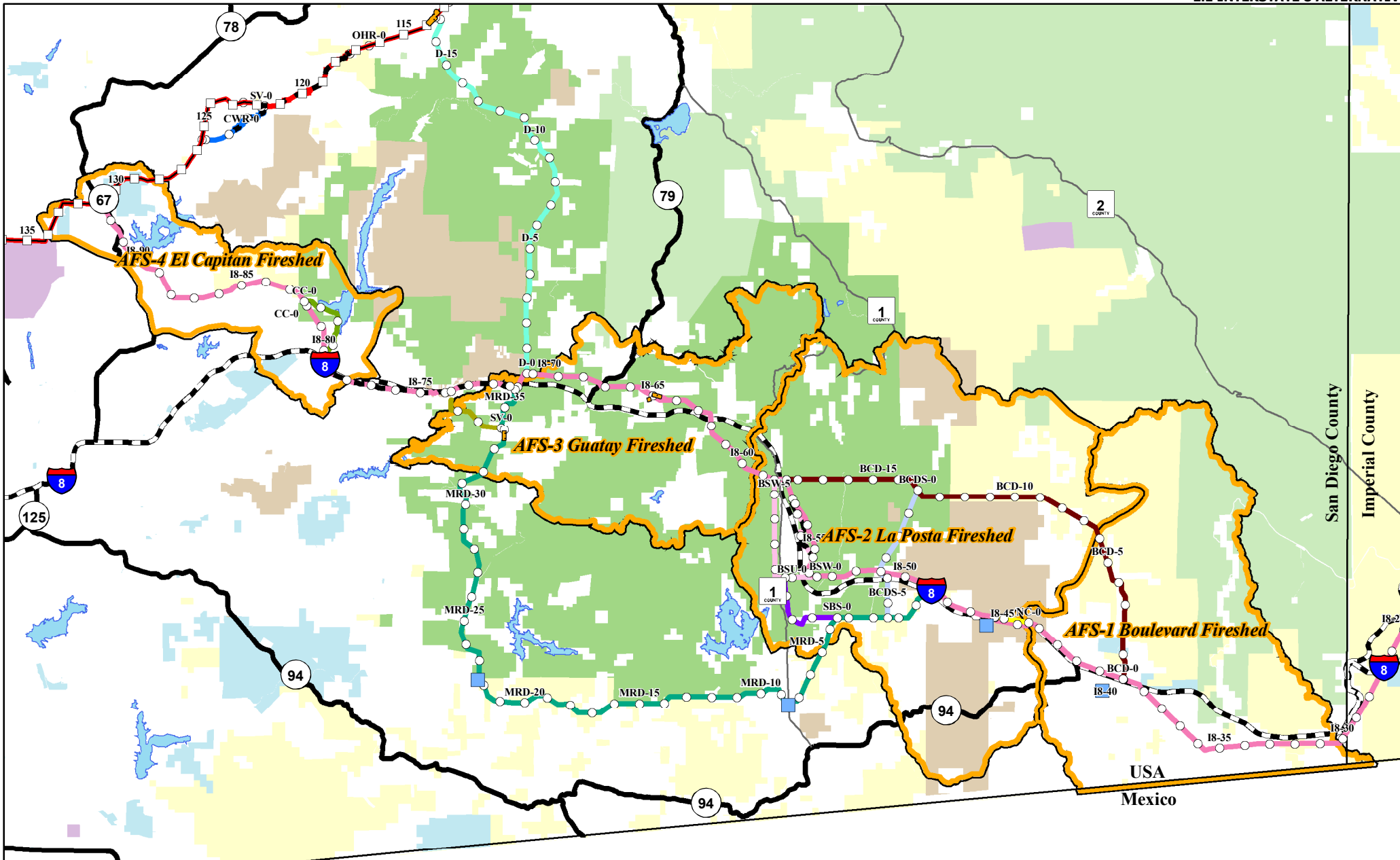
Major events (over 1,000 acres): 3 fires/50 years.

Cumulative number of acres burned: 12,200 acres/50 years.

In the Boulevard Fireshed, the largest fire in the last 50 years is the 1982 Tule Fire that burned 4,645 acres within the fireshed. All other fires have been relatively small with much of the fireshed showing no recorded fire history at all. The lack of fire is the result of sparse vegetation types and the dominance of arid, desert influences. This may change over time due to the invasion of cheatgrass and Sahara mustard, especially during wet years, which creates a continuous fine fuel between the shrubs. These fine fuels are able to carry a wildfire further and faster through the landscape than prior to weed invasion.

This fireshed shares its southern border with Mexico which creates an additional human influence in the wildlands from illegal immigrants crossing into the U.S. Campfires from illegal immigrant camps and recreational activities present a substantial source of reported ignitions over a 13-year history (10%). Figure E.1.15-2 summarizes the ignition history in the Boulevard Fireshed. In 2004, two fires were ignited by illegal immigrants near the border, burning a combined 110 acres within the fireshed. Equipment use represents a slightly greater ignition source over the same period (14%). The ignitions are randomly distributed over the landscape with no identifiable high density ignition areas.

¹ Intermix WUI: where structures are scattered throughout a wildland area and wildland fuels are continuous outside of and within developed areas (population density of 28-250 people per square mile and the average parcel size is less than 40 acres). (Federal Register (USDA/USDI 2001))



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<ul style="list-style-type: none"> Interstate 8 Alternative, Overhead Portion Interstate 8 Alternative, Underground Portion Buckman Springs Underground Option West Buckman Springs Option Chocolate Canyon Option South Buckman Springs Option Route D Alternative BCD Alternative Modified Route D Alternative BCD South Option Campo North Route Option 	<ul style="list-style-type: none"> Star Valley Option Chuck Wagon Road Alternative, Overhead Portion Chuck Wagon Road Alternative, Underground Portion Proposed Project Overhead 230kV Proposed Project Underground 230kV Alternative Route Milepost Proposed Project Milepost Interstate 8 Firesheds 	<ul style="list-style-type: none"> Existing Substation (69/12kV) Proposed Substation 	<ul style="list-style-type: none"> Department of Defense Land Bureau of Land Management Land State Land U.S. Forest Service Land Tribal Land
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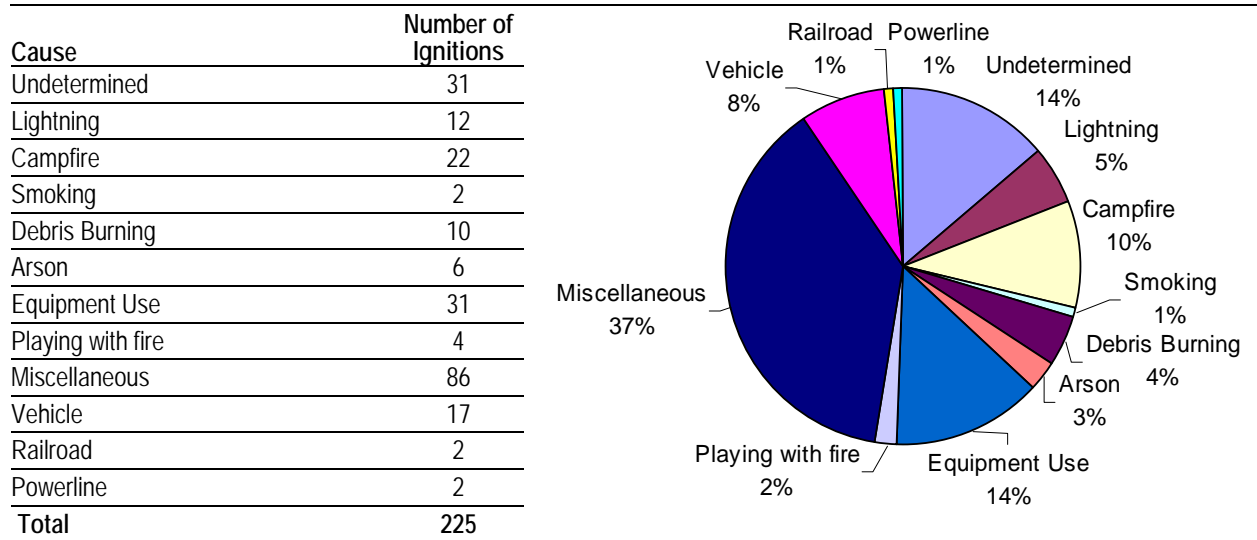
Sunrise Powerlink Project

Figure E.1.15-1
Interstate 8 Alternative Overview Map

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Figure E.1.15-2. Reported 13-Year Wildfire Ignition History in Boulevard Fireshed

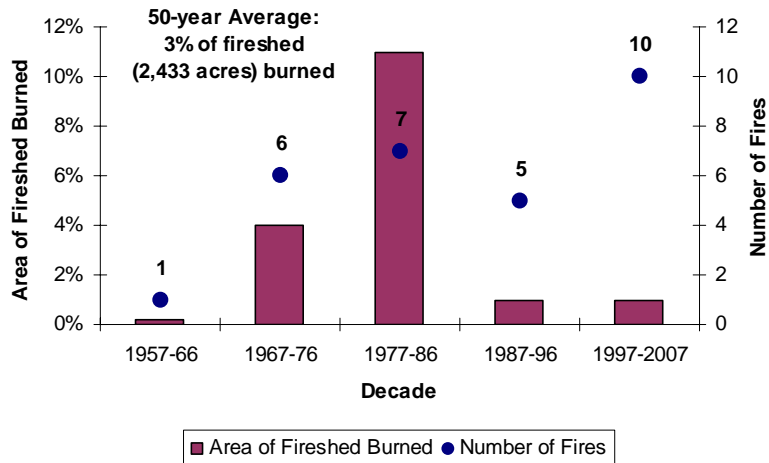


Source: Forester's Co-Op Fire Atlas Data.

The desert environment of the Boulevard Fireshed contains sparse vegetation which limits the spread of wildfires started in this area. As a result, the wildfire history indicates that only small portions of the region have burned in wildfire events over the last 50 years. An average of 3% or 2,433 acres burned per decade in the Boulevard Fireshed based on the 50-year fire records (Figure E.1.15-3; for methods see Section D.15.4.3). After the 1982 Tule Fire, a gradual downward trend in the acreage burned was documented in the following two decades. In the past decade (1997-2007), the highest number of wildfires occurred, but all were contained to a relatively small area, burning a cumulative 1% of the fireshed area.

The level of human influence within this fireshed is a key indicator of future wildfire ignitions. Humans are responsible for 81% of the wildfire ignitions over the past 13 years as compared to 5% of the ignitions occurring naturally from lightning. The random occurrence of lightning ignitions is expected to remain constant throughout the landscape. Over the 50-year wildfire history, humans started 18 of the 29 wildfires that burned within the fireshed, lightning started 2 wildfires and the rest of the wildfire sources are undetermined. The high number of historically undetermined wildfire sources may be attributed to outdated wildfire reporting and source identification practices, which have become more accurate in recent times. The level of human wildfire influence is expected to increase within this Intermix WUI fireshed in the future due to the development potential within the private lands, which are surrounded by extensive wildland fuels.

Figure E.1.15-3. Boulevard Fireshed 50-year Wildfire History



Source: Forester's Co-Op Fire Atlas Data.

Vegetation

The dominant vegetation type in this fireshed is extremely sparse desert chaparral, which transitions into desert scrub further east. There are scattered patches of juniper woodland strewn among the large, granitic boulders that dominate the eastern portion of the I-8 corridor. Cheatgrass and Sahara mustard have started to invade the fireshed, these fire-adapted weeds can quickly spread, altering the plant community and contributing to type-conversion. Table E.1.15-2 presents a complete vegetation summary.

Table E.1.15-2. Vegetation Composition of Boulevard Fireshed

Vegetation Type	Acres	Cover
Chaparral	6617	65%
Live Oak	386	4%
Desert Scrub	1639	16%
Juniper Woodland	539	5%
Out Area	1076	10%
Total	10257	100%

Source: Forester's Co-Op Fire Atlas Data.

Fire Prevention Practices & Resources

The responsibility for fire suppression and prevention in this fireshed is divided between the San Diego Rural Fire Protection District (SDRFP) and the California Department of Forestry and Fire Protection (CAL FIRE), with the Boulevard area covered by the part-time Boulevard Fire and Rescue with a single station. CAL FIRE operates two seasonal fire stations (McCain Valley Camp and White Star Station). SDRFP has a part-time station. Considering the low population density of this fireshed, it has significant fire protection resources. However, water sources are limited which will compromise extensive firefighting suppression activities during a major fire event. The San Diego County Airport in Jacumba is a resource for fire suppression air attacks in this remote region. A recent fuel reduction treatment on 1,264 acres in the Manzanita Reservation was completed in 2003 by the Bureau of Indian Affairs. The communities of Boulevard, Jacumba, and Manzanita are federally designated as communities at risk of wildfire.

La Posta Fireshed (AFS-2)

Total assessment area: 107,088 acres

The La Posta Fireshed is located in the southeastern part of San Diego County bordered to the northwest by County Road S1, to the north by the McCain Valley, and it includes a portion of State Highway 94. The Interstate 8 Alternative passes overhead through this fireshed for 14.8 miles. In addition, the I-8 Buckman Springs Option, the I-8 Buckman Springs Underground Option, the BCD Alternative, and the Modified Route D Alternative pass through this fireshed (see Sections E.2.15.1 and E.4.15.1 for a description of the BCD and Modified Route D Alternatives). The towns of Boulder Grove, Live Oak Springs, Cuyapaibe, and La Posta are located within the fireshed, all of which are federally designated communities at risk of wildfire. The eastern boundary runs through the In-Ko-Pah Mountains, which is a BLM Area of Critical Environmental Concern.

Table E.1.15-3. Land Ownership Summary of La Posta Fireshed

Ownership	Acres	Portion of Fireshed
City of SD	322	<1%
County of SD	2	<1%
BLM	17,494	16%
USFS	36,017	34%
Military	0	0%
Native American Reservation	25,372	24%
State of CA	881	1%
SDG&E	17	<1%
Other (private, etc.)	26,983	25%
Total	107,088	100%

Source: Forester's Co-Op Fire Atlas Data.

The fireshed contains a large portion of Cleveland National Forest to the west with private land in-holdings scattered within the wildlands (34%). Table E.1.15-3 summarized land ownership in the La Posta Fireshed. The Manzanita, La Posta, Campo, and Cuya-

paipa Native American Reservations also contain extensive wildlands in the central portion of the fireshed (24%). BLM land manages the other 16% of the wildlands within the La Posta Fireshed. The elevation ranges from 3,880 feet at Live Oak Springs to 5,960 feet at Mt. Laguna. The average annual rainfall range is between 22 inches in the high elevation areas of CNF with a gradual drop eastward to 11 inches as a portion of the fireshed drops into the desert region. The entire fireshed is in the rain shadow of the Laguna Mountains. Consequently, the vegetation ranges from coniferous forests along County Highway S1 to sparse chaparral and higher elevation sagebrush communities to the east.

The La Posta Fireshed is primarily composed of reservation wildlands and public wildlands consisting of CNF and BLM land. The private lands scattered throughout the fireshed comprise 25% of the fireshed area. The average parcel size is 29 acres indicating a development potential on private lands. The population density on private lands is 56 people per square mile. Potential future population growth within the fireshed will be concentrated within these private landholdings, which will increase the human influence on the surrounding wildlands thereby expanding the WUI. This fireshed is categorized as an Intermix WUI.² Intermix WUI areas have an elevated risk of wildfires due to the intermediate scale of development that has fragmented the wildlands, but not enough to disrupt the spread of wildfires (Syphard et al., 2007). In other words, wildlands are sufficiently contiguous to provide continuous fuels, which makes this fireshed prone to large fires. Because development is interspersed so extensively with wildland areas, human ignitions are more frequent, and fires sweeping through this fireshed have a high potential to be damaging to the intermixed community. The intermixed community is developed at a relatively low density (28-250 persons/square mile) compared with Interface WUI communities (250+ persons/square mile; see Section D.15.6, Ramona Fireshed, for a description of an Interface WUI).

Fire History

Fire frequency: 36 recorded fires/50 years.

Extended attack between 500 – 1,000 acres: 5 fires/50 years.

Major events (over 1,000 acres): 4 fires/50 years.

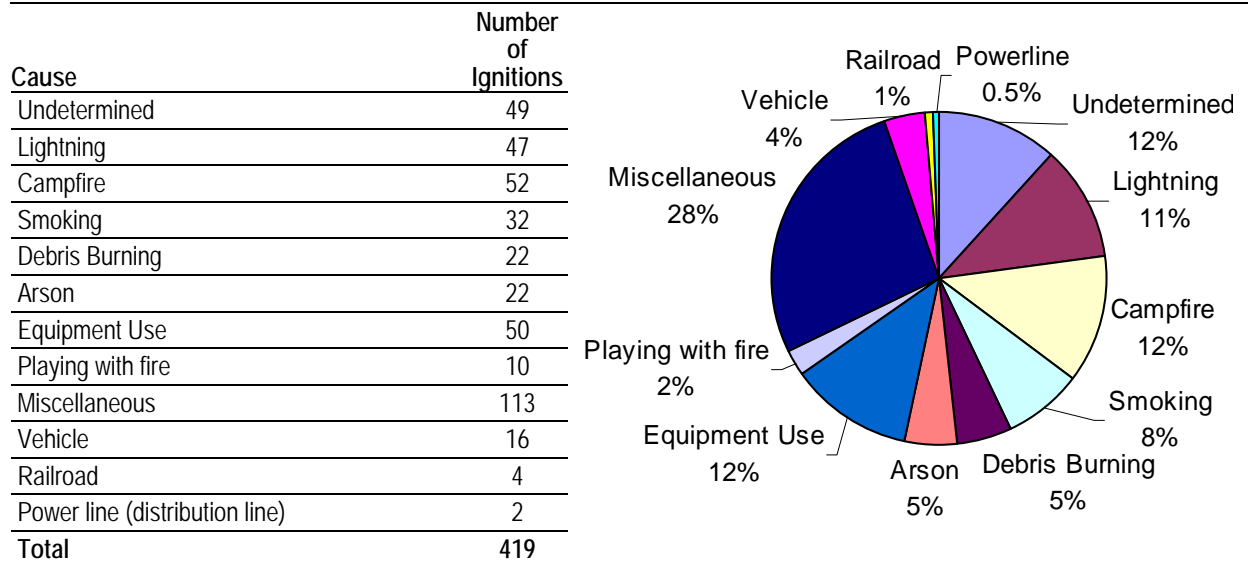
Cumulative number of acres burned: 26,400 acres/50 years.

The extensive wildlands in this fireshed have fueled many wildfires to burn through the region. Two large fires burned through this area in 1944, burning 70% of the fireshed. A total of 64,421 acres burned in CNF from County Road S1 to I-8, and another 9,790 acres burned between SR94 and I-8. The 1970 Laguna Fire was ignited in this region by a downed electrical distribution line, burning 14,038 acres within the fireshed. This was followed three years later by the Boulder Oaks Fire that burned 2,221 acres.

There have been 419 reported wildfire ignitions over the past 13 years, the highest number of ignitions for all 14 SRPL Firesheds. Most of these ignitions are concentrated in the Native American Tribal lands. Figure E.1.15-4 summarizes the ignition history in the La Posta Fireshed. Campfires are the greatest identified ignition source (12%), most of which occur in CNF, reflecting the high recreational use in the area and possibly the influence of illegal immigrant camps. Lightning strikes are prevalent in this fireshed, representing 11% of the total. These ignitions typically occur during the late summer to early fall fire season when fire fuels are the driest. There is a high density of equipment-caused ignitions within the Interstate 8 corridor and a high instance of arson fires ignited on tribal lands. Due

² Intermix WUI: where structures are scattered throughout a wildland area and wildland fuels are continuous outside of and within developed areas (population density of 28-250 people per square mile and the average parcel size is less than 40 acres). (Federal Register (USDA/USDI 2001))

Figure E.1.15-4. Reported 13-Year Wildfire Ignition History in Alternative Route La Posta Fireshed



Source: Forester's Co-Op Fire Atlas Data.

to limited access and rough terrain this fireshed has also experienced the greatest number of initial attack escapes (23) out of all 14 firesheds. The high number of wildfire ignitions indicates strong human and natural ignition sources, which combine with extensive wildland fuels, making this an extremely high fire risk area.

The level of human influence within this fireshed is a key indicator of future wildfire ignitions. Humans are responsible for 77% of the wildfire ignitions over the past 13 years as compared to 11% of the ignitions naturally occurring from lightning. The random occurrence of lightning ignitions is expected to remain constant throughout the landscape. Over the 50-year wildfire history, humans started 20 of the 35 wildfires that burned through the fireshed, lightning started 4 wildfires and the rest of the wildfire sources were undetermined. The high number of historically undetermined wildfire sources may be attributed to outdated wildfire reporting and source identification practices, which have become more accurate in recent times. The level of human wildfire influence is expected to increase within this Intermix WUI fireshed in the future due to the development potential within the private lands which are surrounded by extensive wildland fuels.

Vegetation

The rain shadow effect from the Laguna Mountains is the primary influence in determining the vegetation types within this fireshed. The dominant vegetation type is by far chaparral, covering 81% of the landscape. However, the chaparral is quite varied with dense stands existing within mountain valleys and north facing slopes, and sparse desert chaparral further east. Extended drought over the past ten years has attributed to shrub mortalities significantly increasing the dry fuel loads. One of the few concentrations of red shank chaparral in California exists near County Highway S1 and Interstate Highway I-8 with additional scattered stands along the I-8 corridor further east. See Table E.1.15-4 for a complete vegetation summary.

Fire Prevention Practices & Resources

The responsibility for fire suppression and prevention in this fireshed primarily rests with the USFS, which has three seasonal fire stations: Cameron, Glencliff, and Cottonwood. A part-time station exists on the Campo Indian Reservation. State Responsibility Areas (SRA) are scattered throughout the fireshed. Significant water resources are readily available for fire suppression at Lake Morena. The communities of Boulder Grove, Live Oak Springs, La Posta, and Cuyapaipe are federally designated as communities at risk of wildfire. Between 2003 and 2004 the Bureau of Indian Affairs (BIA) and the USFS implemented 10 fuel reduction plans totaling 1,626 acres, creating fuel breaks and defensible space for the protection of these rural towns in the event of a wildfire.

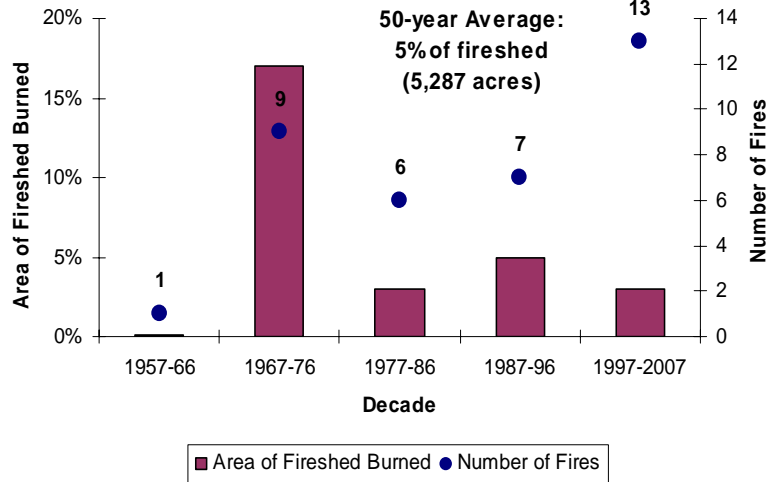
Guatay Fireshed (AFS-3)

Total assessment area: 54,603 acres.

The Guatay Fireshed is located along Interstate Highway 8 with State Highway 79 bisecting the northern portion. The Interstate 8 Alternative would pass through this fireshed overhead for 12.1 miles and underground for 0.7 miles. In addition, the Modified Route D Alternative would pass overhead through this fireshed for 4.7 miles (see Section E.4.15.1 for a description of the Modified Route D Alternative through this fireshed). This fireshed includes the towns of Pine Valley, Guatay, Descanso, and part of Hulburd Grove, all of which are federally registered communities at risk of wildfire. The Pine Creek Wilderness within the CNF is located in the central-southern half of the fireshed. Elevation ranges between 1,355 feet at Loveland Reservoir to 4,885 feet on Guatay Mountain and 5,100 feet in the northern-most reaches of the fireshed. The average annual rainfall ranges between 22.5 and 27.5 inches. This relatively high level of moisture creates dense stands of chaparral with some scattered conifers in the Pine Valley area.

In the Guatay Fireshed, 66% of the area is held within the public wildlands of CNF, BLM, State of California, and County of San Diego. Table E.1.15-5 summarizes land ownership in the Guatay Fireshed. The remaining 34% private ownership consists of scattered parcels interspersed within CNF. The average private parcel size is seven acres, indicating a development potential on private lands. The population density on private lands is 213 people per square mile. Potential future population growth within the fireshed will be concentrated within these private land-holdings, which will increase the human influence on the surrounding wildlands thereby expanding the WUI. This fireshed is categorized as

Figure E.1.15-5. La Posta Fireshed 50-year Wildfire History



Source: Forester's Co-Op Fire Atlas Data.

Table E.1.15-4. Vegetation Composition of La Posta Fireshed

Vegetation Type	Acres	Cover
Chaparral	17,752	81%
Live Oak	1,352	6%
Scrub	1,275	6%
Out Area	1,480	7%
Total	21,859	100%

an Intermix WUI.³ Intermix WUI areas have an elevated risk of wildfires due to the intermediate scale of development that has fragmented the wildlands, but not enough to disrupt the spread of wildfires (Syphard et al., 2007). In other words, wildlands are sufficiently contiguous to provide continuous fuels, which makes this fireshed prone to large fires. Because development is interspersed so extensively with wildland areas, human ignitions are more frequent, and fires sweeping through this fireshed have a high potential to be damaging to the intermixed community. The intermixed community is developed at a relatively low density (28-250 persons/square mile) compared with Interface WUI communities (250+ persons/square mile; see Section D.15.6, Ramona Fireshed, for a description of an Interface WUI).

Fire History

- Fire frequency: 19 recorded fires/50 yrs.**
- Extended attack between 500 – 1,000 acres: 3 fires/50 yrs.**
- Major events (over 1,000 acres): 4 fires/50 yrs.**
- Cumulative number of acres burned: 47,700 acres/50 years.**

The Guatay Fireshed has been partially burned during two of the three of the largest fires in San Diego County’s recorded history: the 2003 Cedar Fire and the 1970 Laguna. The 2007 Witch Fire burned up to the fireshed’s northern border. This is an indication of the topographical features within the fireshed that align in such a way to create one of the most active fire corridors in San Diego County. The area surrounding the alignment of the Sweetwater River, SR79, and I-8 can be considered a wildfire nexus whereby environmental factors favor ignitions and rapid fire spread all in one location. This area south of Descanso, where the Interstate 8 Alternative route is located, also contains the greatest density of equipment- and arson-caused ignitions.

There have been 233 reported wildfire ignitions within the Guatay Fireshed over the past 13 years. The greatest concentrations of ignitions within this fireshed and within the entire Descanso Ranger District of the CNF occur along the Interstate 8 corridor. Interstate 8 is a heavily used transportation route that adds an additional human influence to the immediate area. Table E.1.15-6 summarizes the ignition history in the fireshed. Equipment use represents the greatest identified ignition source (28%), contributing to a majority of the ignitions within the I-8 corridor. The 2001 Viejas Fire was ignited by a cigarette on the I-8 median that was propelled by 60 mph Santa Ana winds that ended up burning 10,000 acres. Costs for this fire totaled \$8 million in fire suppression resource expenses and property damage.

Table E.1.15-5. Land Ownership Summary of Guatay Fireshed

Ownership	Acres	Portion of Fireshed
City of SD	0	0%
County of SD	107	<1%
BLM	3,293	6%
USFS	32,440	59%
Military	0	0%
Native American Reservation	8	<1%
State of CA	347	1%
SDG&E	0	0%
Other (private, etc.)	18,408	34%
Total	54,603	100%

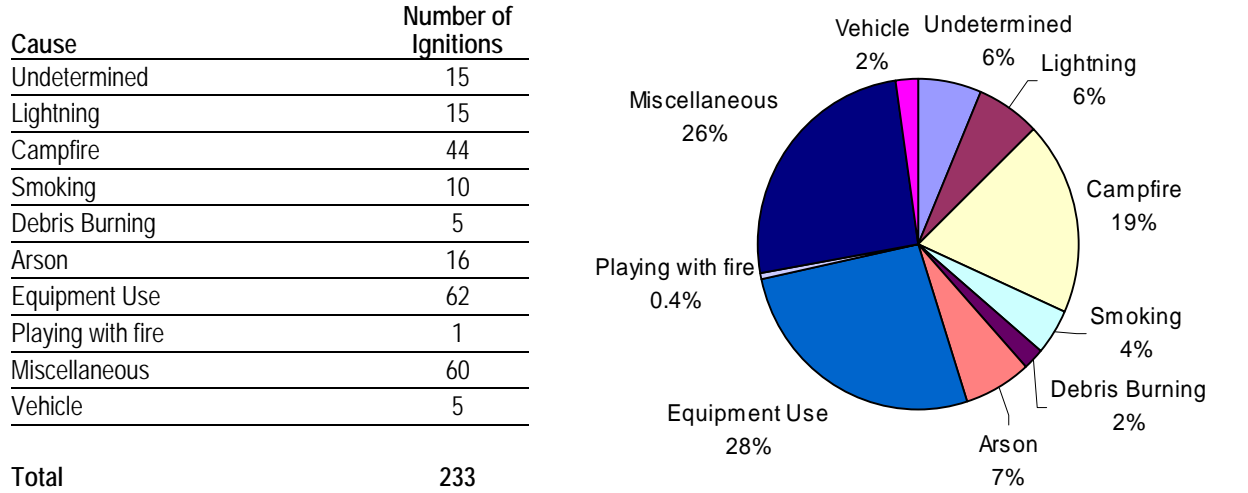
Source: Forester’s Co-Op Fire Atlas Data.

Table E.1.15-6. Vegetation Composition of Guatay Fireshed

Vegetation Type	Acres	Cover
Chaparral	6,305	76%
Live Oak	792	10%
Scrub	40	<1%
Oak Woodland	491	6%
Out Area	683	8%
Total	8,311	100%

³ Intermix WUI: where structures are scattered throughout a wildland area and wildland fuels are continuous outside of and within developed areas (population density of 28-250 people per square mile and the average parcel size is less than 40 acres). (Federal Register (USDA/USDI 2001))

Figure E.1.15-6. Reported 13-Year Wildfire Ignition History in Alternative Route Guatay Fireshed

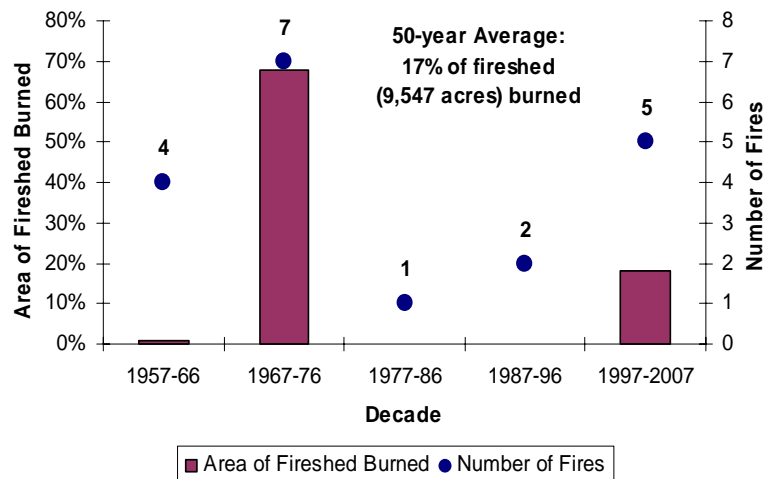


Source: Forester's Co-Op Fire Atlas Data.

Campfires also contribute to a large number of wildfire ignitions (19%) within the Guatay Fireshed. These ignitions are concentrated in the Laguna Recreation Area and the Pine Creek Wilderness. Campfire ignitions in remote areas, such as Pine Creek Wilderness, are often attributed to illegal immigrant campfires. An example of this type of wildfire ignition is the 2006 Horse Fire which burned a total of 16,681 acres in the southern part of the Pine Creek Wilderness within the adjacent Campo Fireshed. Wildfires started in remote wildland areas have a delayed reporting and response time due to limited ground-based firefighter access, which can attribute to initial attack escapes and larger, more damaging fires. The close proximity to the U.S.-Mexico border creates a greater human influence and higher risk of ignitions within the wildlands of the Guatay Fireshed.

The Guatay Fireshed wildfire history indicates that this region has burned in several major wildfire events. An average of 17% or 9,547 acres burned per decade in the Guatay Fireshed based on the 50-year fire records (Figure E.1.15-7; for methods see Section D.15.4.3). After the 1970 Laguna Fire, which burned 35,340 acres within the fireshed, a dramatic downward trend in the acreage burned and number of wildfires was documented in the following two decades. In the past decade (1997-2007), the 2001 Viejas and 2003 Cedar Fires caused a recent spike, burning a combined 7,676 acres within the fireshed.

Figure E.1.15-7. Guatay Fireshed 50-year Wildfire History



Source: Forestekr's Co-Op Fire Atlas Data.

The level of human influence within this fireshed is a key indicator of future wildfire ignitions. Humans are responsible for 88% of the wildfire ignitions over the past 13 years as compared to 6% of the ignitions naturally occurring from lightning. The random occurrence of lightning ignitions is expected to remain constant throughout the landscape. Over the 50-year wildfire history, humans started 15 of the 18 large wildfires (greater than 25 acres) that burned within the fireshed, there were no lightning-started fires, and the rest of the wildfire sources were undetermined. The high number of historically undetermined wildfire sources may be attributed to outdated wildfire reporting and source identification practices, which have become more accurate in recent times. The level of human wildfire influence is expected to increase within this Intermix WUI fireshed in the future due to the development potential within private lands surrounded by extensive wildland fuels.

Vegetation

The predominant vegetation type within this fireshed is chaparral. Nearly the entire southern half of the fireshed burned during the 1970 Laguna Fire. Consequently, the majority of the mixed chaparral within this area is 37 years old. The last ten years of drought have contributed to considerable amounts of mortality for a number of chaparral species including manzanita, chamise, and ceanothus. Higher elevation stands such as those along Pine Creek Road and County Road S1 do not show much impact from drought as they experience higher rainfall. In these higher elevation areas that are primarily dominated by manzanita, the chaparral takes on a more characteristic montane form, with a low, compact structure. One location of special note is Guatay Mountain which has no recorded fire history and represents one of the last remaining stands of old-growth chaparral in San Diego County. In addition to rare, old-growth stands of scrub oak and manzanita chaparral, several sensitive plant species exist on the mountain. The most prominent is the Tecate cypress which is concentrated in several groves on the northern face of the mountain. Individual specimens are also found scattered across the slope. This population represents the last remaining old-growth stand of the species in California. The other populations have been subjected to repeated fires and are threatened with extirpation. Consequently, Guatay Mountain represents one of the region's most unique botanical resources. Table E.1.15-6 presents a complete vegetation summary.

Fire Prevention Practices & Resources

The responsibility for fire suppression and prevention in the CNF is the USFS, which operates a seasonal fire station in Descanso. The San Diego Rural Fire Department also operates a full-time station. The town of Pine Valley and surrounding areas are protected by the Pine Valley Fire District, which operates a part-time fire station in town. Water sources for fire suppression are located at Loveland Reservoir. The communities of Descanso, Guatay, Pine Valley, and Hulburd Grove have been federally designated as communities at risk of wildfire. The steep topography and extensive fuel loads in the surrounding wildland areas create a high wildfire risk in these towns.

The implementation of fire prevention programs such as fuels reduction and the building of strategic fuel-breaks reduced the amount of damaging impacts that could have been sustained during the Cedar Fire in the Guatay Fireshed. The 'Tragedy Springs' Hazardous Fuel Reduction project in the northeast section of the fireshed aided in slowing the eastward expansion of the Cedar Fire, helping to protect the communities of Guatay, Descanso, and Pine Valley. The fuel-reduction project consisted of a three-phase prescribed burn that took place between 2001 and 2003 (pre-Cedar Fire) totaling 2,039 treated acres. An estimated minimum of 30,000 acres were saved from the fire as a result of this successful fuel-reduction project. Two additional fuel breaks totaling 371 acres were completed in April 2003 within CNF land around the town of Pine Valley. In 2005, another 80-acre fuel-break was constructed in this area.

Boulder Creek Fireshed (AFS-5)

Total assessment area: 30,110 acres.

The Boulder Creek Fireshed is north of Interstate 8 and extends through one of the most undeveloped areas in San Diego County. The Interstate 8 Alternative would pass underground for 2.6 miles and the Route D Alternative would pass overhead for 8 miles in this fireshed (see Section E.3.15.1 for a description of the Route D Alternative through this fireshed). The Boulder Creek Fireshed is bisected by Boulder Creek Road and is bordered to the east by Cuyamaca Rancho State Park. It includes the communities of Sherilton Valley, Hulburd Grove, The Willows, and the eastern end of Alpine. It also includes portions of the Capitan Grande and Viejas Reservations. The elevation ranges from 2,200 feet near Interstate 8 to 6,500 feet on the western slope of Cuyamaca Peak. The average annual rainfall ranges from 22.5 inches in the west to 27.5 inches in the east.

CNF land comprises a vast portion of the fireshed, with a sliver of Cuyamaca Rancho State Park in the northeast. This fireshed is relatively undeveloped, with private land in-holdings throughout the CNF comprising 28% of the total fireshed area. Table E.1.15-7 summarizes land ownership. The Viejas Reservation and a portion of the Capitan Grande Reservation encompass 21% of the area. The average private parcel size is seven acres, indicating a high development potential within the fireshed. The population density within the private lands is 213 people per square mile. Potential future population growth within the Boulder Creek Fireshed will be concentrated within these private land-holdings, which would increase the human influence on the surrounding wildlands thereby expanding the WUI. This fireshed is categorized as an Intermix WUI.⁴ Intermix WUI areas have an elevated risk of wildfires due to the intermediate scale of development that has fragmented the wildlands, but not enough to disrupt the spread of wildfires (Syphard et al., 2007). In other words, wildlands are sufficiently contiguous to provide continuous fuels, which makes this fireshed prone to large fires. Because development is interspersed so extensively with wildland areas, human ignitions are more frequent, and fires sweeping through this fireshed have a high potential to be damaging to the intermixed community. The intermixed community is developed at a relatively low density (28-250 persons/square mile) compared with Interface WUI communities (250+ persons/square mile; see Section D.15.6, Ramona Fireshed, for a description of an Interface WUI).

Table E.1.15-7. Land Ownership Summary of Boulder Creek Fireshed

Ownership	Acres	Portion of Fireshed
City of SD	0	0%
County of SD	0	0%
BLM	1,476	5%
USFS	11,945	40%
Military	0	0%
Native American Reservation	6,363	21%
State of CA	1,878	6%
SDG&E	3	<1%
Other (private, etc.)	8,446	28%
Total	30,111	100%

Source: Forester's Co-Op Fire Atlas Data.

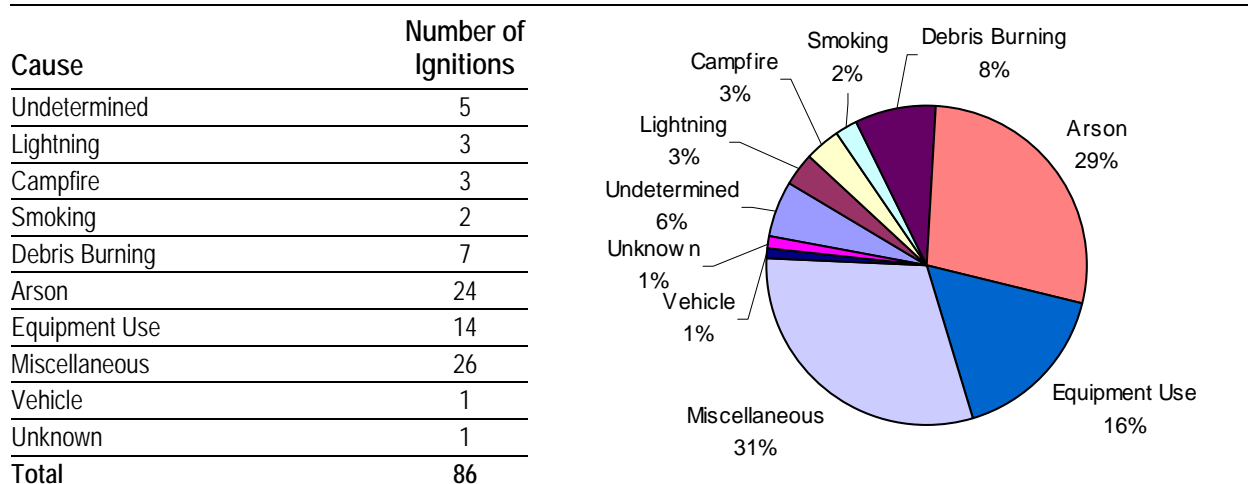
Fire History

Fire frequency: 10 recorded fires/50 yrs.
Extended attack between 500 – 1,000 acres: 1 fire/50 years.
Major events (over 1,000 acres): 2 fires/50 years.
Cumulative number of acres burned: 32,400 acres/50 years.

⁴ Intermix WUI: where structures are scattered throughout a wildland area and wildland fuels are continuous outside of and within developed areas (population density of 28-250 people per square mile and the average parcel size is less than 40 acres). (Federal Register (USDA/USDI 2001))

The Boulder Creek Fireshed was almost completely consumed by the 2003 Cedar Fire (93% of the fireshed area burned). The 2007 Witch Fire burned 201 acres in the northwestern-most corner of this fireshed. Significant firefighting resources were used during the Cedar Fire to protect the community of Descanso in the adjacent Guatay Fireshed. A similar defense was successfully conducted during the 1950 Conejos Fire which burned nearly the entire fireshed as well. However, the community of Sherilton Valley was without fire protection due to its remote nature and lack of access. Even without active fire suppression resources in the area, many homes within the Sherilton Valley area were saved from burning during the Cedar Fire due to fuels reduction around homes prior to the fire.

Figure E.1.15-8. Reported 13-Year Wildfire Ignition History in Alternative Route Boulder Creek Fireshed



Source: Forester's Co-Op Fire Atlas Data.

Prior to the Conejos Fire there was a large fire in 1934 that consumed most of the central portion of this fireshed. Large fires are a common occurrence for this area. This pattern is the result of the topography, the funneling of Santa Ana winds, and the dense vegetation that regenerates after each fire event. In conjunction with the adjacent Guatay Fireshed, these factors create one of the most active fire corridors in San Diego County.

There have been 86 ignitions in the Boulder Creek Fireshed over the past 13 years, which is the second lowest number of ignitions out of all of the firesheds. The Boulder Creek Fireshed has experienced the highest number of arson-ignited fires (29%). Table E.1.15-8 summarizes the ignition history. These ignitions have occurred mainly within and around the Viejas Reservation. Equipment use (16%) is the second most prevalent ignition source, and these ignitions are concentrated along the Interstate 8 corridor.

Table E.1.15-8. Vegetation Composition of La Posta Fireshed

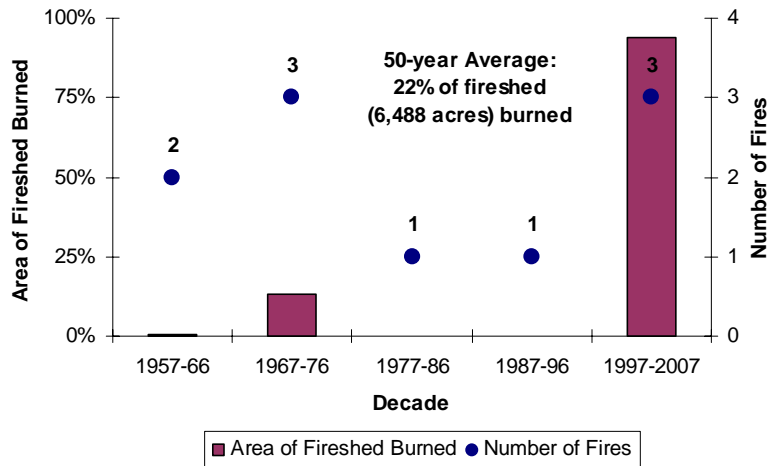
Vegetation Type	Acres	Cover
Chaparral	17,752	81%
Live Oak	1,352	6%
Scrub	1,275	6%
Out Area	1,480	7%
Total	21,859	100%

Source: Forester's Co-Op Fire Atlas Data.

An average of 22% or 6,488 acres burned per decade in the Boulder Creek Fireshed based on the 50-year wildfire records (Figure E.1.15-9; for methods see Section D.15.1.2). The dramatic upward trend in the acreage burned during the past decade is a result of the Cedar Fire, which burned much more area than in the previous combined four decades (27,990 acres within the fireshed). The number of wildfires within the fireshed has remained relatively low over the past 50 years, ranging from 1 to 3 fires per decade.

The level of human influence within this fireshed is a key indicator of future wildfire ignitions. Humans are responsible for 91% of the wildfire ignitions over the past 13 years as compared to 3% of the ignitions naturally occurring from lightning. The random occurrence of lightning ignitions is expected to remain constant throughout the landscape. Over the 50-year wildfire history, humans started 7 of the 9 wildfires that burned within the fireshed, one was started by lightning, and the other source is undetermined. The level of human influence is expected to increase within this Intermix WUI fireshed in the future due to the development potential in private lands surrounded by extensive wildland fuels.

Figure E.1.15-9. Boulder Creek Fireshed 50-year Wildfire History



Source: Forester's Co-Op Fire Atlas Data.

Vegetation

The vegetation in the Boulder Creek Fireshed is almost exclusively chaparral. The King Creek Research Natural Area is in the far northeastern corner of this fireshed and is the only known location where the rare Cuyamaca cypress is found. Fuel levels in this area will slowly increase as the chaparral recovers from the Cedar Fire, and will likely reach extreme fuel loading levels within 25 to 30 years with adequate rainfall and no additional disturbances. Table E.1.15-9 presents a complete vegetation summary.

Table E.1.15-9. Vegetation Composition of Boulder Creek Fireshed

Vegetation Type	Acres	Cover
Chaparral	4,494	92%
Live Oak	292	6%
Scrub	22	<1%
Oak Woodland	46	1%
Out Area	56	1%
Total	4,910	100%

Fire Prevention Practices & Resources

Fire suppression and prevention in the Boulder Creek Fireshed are the responsibility of the USFS. However, reflecting the remoteness of this fireshed, the only station within the area is on Viejas Reservation, staffed full-time by the reservation fire department.

The implementation of fire-prevention programs such as fuels reduction and the building of strategic fuel-breaks reduced the amount of damaging impacts caused during the Cedar Fire within the Boulder Creek Fireshed. Homes in the community of Sherilton Valley were saved when the Cedar Fire burned through the area due to the efforts of the local Fire Safe Council, which obtained USFS grant funding in order to maintain defensible space through road and brush clearing. Fuels reduction treatments were applied to a total of 163 acres around Sherilton Valley. Also, effective emergency communication within the community and livestock evacuation plans were established before the Cedar Fire occurred which saved lives and property.

El Capitan Fireshed (AFS-4)

Total assessment area: 34,149 acres

The El Capitan Fireshed is bordered by SR67 to the west, Interstate 8 to the south and includes two major reservoirs, San Vicente Reservoir and El Capitan Lake. The Interstate 8 Alternative would pass overhead for 13.3 miles and underground for 1.3 miles through this fireshed. Contained within this fireshed are the communities of Harbison Canyon and Wildcat Canyon, which were two of the most heavily impacted communities in the 2003 Cedar Fire. Wildcat Canyon is also where 11 of the 17 Cedar Fire fatalities occurred. This fireshed overlaps with the southwest corner of the Ramona Fireshed and the southeast corner of the Poway Fireshed, both of which are described in the Proposed Project route discussion (see Sections D.15.2.7 and D.15.2.8). The elevation in the El Capitan Fireshed ranges from 650 feet at San Vicente Reservoir to 3,675 feet on El Cajon Mountain. The average annual rainfall ranges from 14 inches in the west to 18 inches in the east. The higher elevation areas around El Cajon Mountain receive an average of 22.5 inches of rainfall annually.

A majority of the fireshed is privately owned (54%), and privately held land includes the San Vicente and El Capitan Reservoirs. Table E.1.15-10 summarizes land ownership in the fireshed. The fireshed contains public lands such as several county-owned open space preserves and a small portion of CNF, all of which are surrounded by private lands. The average private parcel size is eight acres, indicating development potential on private lands. The population density on private lands is 640 people per square mile. This fireshed is categorized as an Interface WUI⁵ region where the high level of urban development has fragmented the remaining wildlands, but where extensive wildlands remain adjacent to areas of heavy development. Interface WUI firesheds characteristically have a high number of households at risk. Future population growth within the El Capitan Fireshed will occur within the private lands as subdivisions of parcels and outward urban sprawl from areas of higher-density housing. Development will increase the population density in these areas, creating islands of wildlands in the San Vicente Highlands and El Capitan Preserves.

Table E.1.15-10. Land Ownership Summary of El Capitan Fireshed

Ownership	Acres	Portion of Fireshed
City of SD & Poway	4,073	12%
County of SD	4,022	12%
BLM	2,002	6%
USFS	2,756	8%
Military	0	0%
Native American Reservation	467	1%
State of CA	2,282	7%
SDG&E	11	<1%
Other (private, etc.)	18,537	54%
Total	34,150	100%

Source: Forester's Co-Op Fire Atlas Data.

Fire History

Fire frequency: 41 recorded fires/50 years.

Extended attack between 500 – 1,000 acres: 2 fires/50 years.

Major events (over 1,000 acres): 8 fires/50 years.

Cumulative number of acres burned: 51,500 acres/50 years.

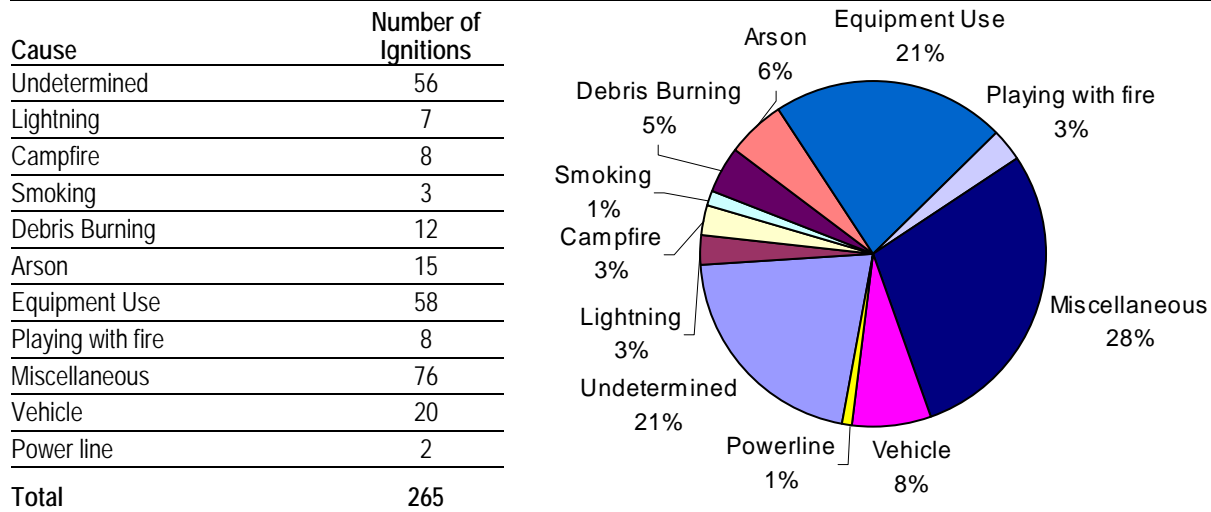
The El Capitan Fireshed was heavily impacted by the 2003 Cedar Fire. Except for a few isolated islands, the entire region burned (89% of the fireshed area). The Cedar Fire split into two fast moving head fires north of this fireshed, near the Barona Casino. The southern portion moved directly in line

⁵ Interface WUI: there is a clear delineation between development and wildland fuels (population density of 250 or more people per square mile, and average parcel size less than 40 acres). (Federal Register (USDA/USDI 2001))

with Wildcat Canyon and the San Diego River drainage that is filled with El Capitan Lake. It jumped Interstate 8 and burned into Harbison Canyon. The Interstate 8 Alternative route travels directly across the point where the fire's jump occurred. The 2007 Witch Fire burned 2% (2,088 acres) of this fireshed. Due to the surrounding topography, this area is considered a high-risk fire corridor, especially during Santa Ana wind conditions.

There have been 265 reported wildfire ignitions in this fireshed over the past 13 years. The largest identified source of ignitions is attributed to equipment use (21%), which mainly occurs along the Interstate 8 corridor (Figure E.1.15-10). There are no other obvious concentrations of ignitions within the fireshed due to the large areas of private property.

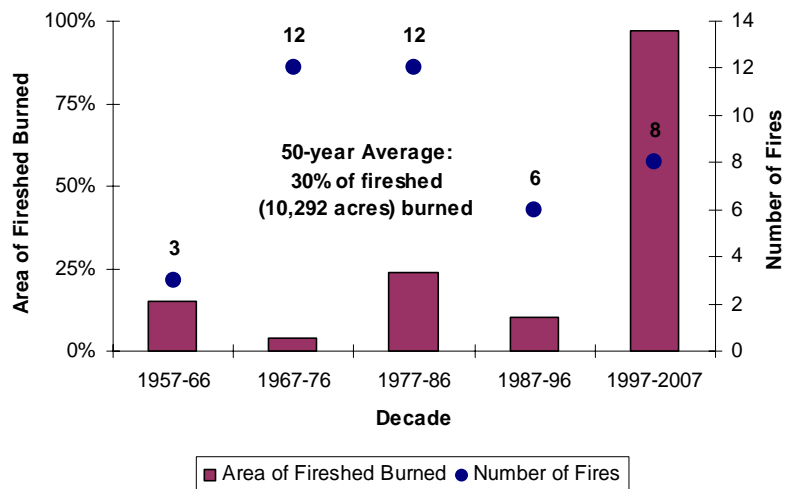
Figure E.1.15-10. Reported 13-Year Wildfire Ignition History in Alternative Route El Capitan Fireshed



Source: Forester's Co-Op Fire Atlas Data.

An average of 30% or 10,292 acres burned per decade in the El Capitan Fireshed based on the 50-year fire records (Figure E.1.15-11; for methods see Section D.15.1.2). The dramatic upward trend in the acreage burned during the past decade is a result of the Cedar Fire, which burned more area than in the previous 40 years combined. The highest number of wildfires occurred during the decades of 1967-76 and 1977-86, but most of these fires were contained to relatively small areas.

Figure E.1.15-11. El Capitan Fireshed 50-year Wildfire History



Source: Forester's Co-Op Fire Atlas Data.

The level of human influence in this fireshed is a key indicator of future wildfire ignitions. Humans are responsible for 76% of the wildfire ignitions over the past 13 years as compared to 3% of the ignitions naturally occurring from lightning. The random occurrence of lightning ignitions is expected to remain constant throughout the landscape. Over the 50-year wildfire history, humans started 26 of the 40 large wildfires (greater than 25 acres) that burned within the fireshed, there were no lightning started fires, and the rest of the sources are undetermined. The high number of historically undetermined wildfire sources may be attributed to outdated wildfire reporting and source identification practices, which have become more accurate in recent times. The level of human wildfire influence is expected to increase within this Interface WUI fireshed in the future due to the development potential in private lands surrounded by extensive wildland fuels.

Vegetation

Previously, most of the fireshed was likely covered by mixed chaparral with some coastal sage scrub components, such as white sage and California sagebrush. The current lack of fire-cued species along the eastern side of Highway 67, such as wild lilac, chamise and a high percentage of invasive species such as mustard, filaree, and wild oats, in addition to significant gopher activity, suggests that much of the area has been type-converted (possibly by grazing and burning) to a degraded laurel sumac shrubland/grassland. Based on the dominant plant species, the site will likely remain relatively open in the foreseeable future on xeric slopes, with invasive species creating fine fuels between scattered laurel sumac specimens. On more mesic slopes, shrubs such as sage will likely fill in the gaps between larger laurel sumac specimens within the next 10 to 15 years.

The terrain between San Vicente Reservoir and El Capitan Lake also shows significant type-conversion of the native coastal sage scrub community. However, there are small remnants of native oak woodlands in drainages and dense chaparral stands on north-facing slopes. The native plant communities that have not been seriously compromised with type-conversion within this area should be able to recover from the Cedar Fire within 15-20 years by replacing most of their canopies, provided there is adequate rainfall and no additional disturbance. The San Diego River Valley between El Capitan Lake and SR67 has been heavily impacted by agricultural use and grazing, to the extent that most of the vegetation in the area has been type-converted to non-native grasslands. Wildfires are easily ignited in dry grasslands like these and can spread very rapidly, especially with the driving force of the Santa Ana winds. Table E.1.15-11 presents a complete vegetation summary.

Table E.1.15-11. Vegetation Composition of El Capitan Fireshed

Vegetation Type	Acres	Cover
Chaparral	3,580	42%
Live Oak	265	3%
Scrub	3,790	45%
Oak Woodland	154	2%
Out Area	658	8%
Total	8,447	100%

Source: Forester's Co-Op Fire Atlas Data.

Fire Prevention Practices & Resources

Fire suppression and prevention in the El Capitan Fireshed are the primary responsibility of the Lake-side Fire Protection District, which has one full-time station in the El Capitan Fireshed. The remainder is mostly a State Responsibility Area under CAL FIRE jurisdiction. Significant water resources for fire suppression are available at El Capitan Lake and San Vicente Reservoir. The community of Flinn Springs in the southern part of the fireshed has been federally designated as a community at risk of wildfire.

E.1.15.2 Environmental Impacts and Mitigation Measures

Environmental impacts and mitigation measures are presented below for the Interstate 8 Alternative. The objective of the mitigation measures, when applicable, is to reduce the impacts to a level that is less than significant. Due to the large scale of the Interstate 8 Alternative and the very high fire risk in San Diego County three of these impacts are not mitigable to a level that is less than significant.

Table E.1.15-12. Impacts Identified – Interstate 8 Alternative – Fire and Fuels Management

Impact No.	Description	Impact Significance
Interstate 8 Alternative and all Options		
F-1	Construction and/or maintenance activities would significantly increase the probability of a wildfire.	Class I
F-2	Presence of the overhead transmission line would significantly increase the probability of a wildfire.	Class I
F-3	Presence of the overhead transmission line would reduce the effectiveness of firefighting.	Class I
F-4	Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread.	Class II

Wildfire Model Results

Burn Probability Model Results

Construction-related ignitions within the Interstate 8 Alternative corridor have the potential to escape initial attack containment and become catastrophic fires. The areas with heavy fire fuels, steep topography, and exposure to the Santa Ana winds will have a higher burn probability and a higher potential for an ignition to escape. The burn probability along the Interstate 8 Alternative route within the Boulevard, La Posta, Guatay, and El Capitan Firesheds is modeled to illustrate regions within the border zone that have a high potential to experience recurring wildfire events.

The model output indicates that 4% of the border zone area has a very high burn probability, 6% has a high burn probability, 16% has a moderate burn probability, and 74% has a low burn probability. Figures E.1.15-2, E.1.15-5, E.1.15-8, and E.1.15-11 show the relative burn probabilities of areas in the Boulevard, La Posta, Guatay, and El Capitan Firesheds within the Interstate 8 Alternative border zone.

The moderate to very high burn probability areas occur where the corridor crosses areas of dense vegetation within the El Capitan County Preserve, CNF, and BLM lands. The model output for each fireshed is summarized in Table E.1.15-13.

Table E.1.15-13. Interstate 8 Alternative Burn Probability Route Summary

Fireshed	Low	Moderate	High	Very High
Boulevard	86%	12%	2%	<1%
La Posta	78%	16%	3%	3%
Guatay	59%	20%	12%	9%
El Capitan	70%	16%	8%	6%
Route Summary	74%	16%	6%	4%

Source: Forester's Co-Op Model Output

Fire Behavior Trend Model Results

In the event of a wildfire within the Boulevard, La Posta, Guatay, and El Capitan Firesheds, damaging impacts are likely to occur because the area experiences severe Santa Ana wind conditions that can rapidly propel a wildfire through the landscape.

During normal weather conditions, ignitions along the transmission line would burn primarily within the half mile border zone. More extensive areas would burn under these conditions where the corridor crosses areas with heavy fuel loads. In the Boulevard Fireshed, ignitions started along this section of the alternative route would burn northeastward into adjacent BLM, State and private lands, this includes a section of the Table Mountain Wilderness that the BLM has categorized as an Area of Critical Concern. Fires started within the La Posta Fireshed alternative route corridor would burn into the La Posta Reservation and the fuel-laden Cleveland National Forest lands near Buckman Springs. The Interstate 8 Alternative route through the Guatay Fireshed primarily crosses CNF land which contains heavy fuel loads that would enable a fire started in the corridor to burn greater areas threatening the towns of Pine Valley and Descanso and two cell towers. In the El Capitan Fireshed, heavy fuels adjacent to the border zone would allow a fire started within the corridor to burn into the CNF and El Capitan County Open Space Preserve. Figures E.1.15-16 through E.1.15-19 show the fire behavior trend during normal weather conditions (Map A) compared to the fire behavior trend during extreme fire weather conditions (Map B) for all four of the firesheds that the Interstate 8 Alternative traverses.

Under extreme weather conditions, ignitions along the transmission line would burn to the southwest threatening many communities and extensive areas of public and private lands. In the Boulevard Fireshed a fire started in extreme conditions has the potential to burn extensive areas of BLM and private lands around the towns of Jacumba, Bankhead Springs and Boulevard and threaten 7 cell towers. The potential burn area from a wildfire started along the Boulevard Fireshed section of the Interstate 8 Alternative would be almost two times greater during extreme Santa Ana weather conditions compared to normal conditions. Within the La Posta Fireshed, a fire started on the alternative route could spread through extensive areas of the Campo Reservation and CNF, posing a threat to the communities of Boulder Oaks and Buckman Springs. The potential burn area from a wildfire started along the La Posta Fireshed section of the Interstate 8 Alternative would be more than for times greater during extreme Santa Ana weather conditions compared to normal conditions. In the Guatay Fireshed, a fire ignited within the corridor would burn through a substantial area of the Pine Creek Wilderness and the Vieja Reservation due to the wildland fuels present. Interstate 8 would potentially create a fire break for a fire burning southwest from border zone, unless sparks or other conditions allowed the fire to jump the width of the interstate. The potential burn area from a wildfire started along the Guatay Fireshed section of the Interstate 8 Alternative would be more than five times greater during extreme Santa Ana weather conditions compared to normal conditions. Within the El Capitan Fireshed fires started within the corridor have the potential to burn through the town of Glen Oaks into the Crestridge Ecological Preserve, extensive areas of private land around the San Diego River Canyon and areas to the west of the San Vicente Highlands Preserve. The potential burn area from a wildfire started along the El Capitan Fireshed section of the Interstate 8 Alternative would be four-fold greater during extreme Santa Ana weather conditions compared to normal conditions. Due to the close proximity of this alternative route to the heavily trafficked Interstate, a potential wildfire started in the area would obstruct this main transportation and evacuation route through the region.

During normal weather conditions, as many as 52 homes and 25,954 acres would be at risk during two burn periods. During extreme weather conditions, as many as 657 homes and 96,815 acres would be at risk during two burn periods (Table E.1.15-14).

Table E.1.15-14. Interstate 8 Alternative Fire Behavior Trend Model Summary

Fireshed	Normal Weather		Extreme Weather	
	Homes at risk	Acres at risk	Homes at risk	Acres at risk
Boulevard	9	8,306	28	15,524
La Posta	5	6,728	62	28,750
Guatay	25	6,958	227	37,171
El Capitan	13	3,962	340	15,370
Total	52	25,954	657	96,815

Figure E.1.15-12. Boulevard Fireshed Interstate 8 Alternative Burn Probability Model
[CLICK HERE TO VIEW](#)

Figure E.1.15-13. La Posta Fireshed Interstate 8 Alternative Burn Probability Model
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Figure E.1.15-14. Guatay Fireshed Interstate 8 Alternative Burn Probability Model
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Figure E.1.15-15. El Capitan Fireshed Interstate 8 Alternative Burn Probability Model
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Figure E.1.15-16. Boulevard Fireshed Interstate 8 Alternative Fire Behavior Trend Model
[CLICK HERE TO VIEW](#)

Figure E.1.15-17. La Posta Fireshed Interstate 8 Alternative Fire Behavior Trend Model
[CLICK HERE TO VIEW](#)

Figure E.1.15-18. Guatay Fireshed Interstate 8 Alternative Fire Behavior Trend Model
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Figure E.1.15-19. El Capitan Fireshed Interstate 8 Alternative Fire Behavior Trend Model
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Wildfire Containment Conflict Model Results

Tactical firefighting management decisions made during wildfires are based on assessment of fire behavior and the ability of ground and aerial firefighters to safely attack a fire. The Wildfire Containment Conflict Model is used to identify areas along the transmission line where significant conflicts with wildfire suppression efforts would be created by the introduction of the proposed overhead transmission line, defined as segments with at least 1.5 consecutive miles of very high conflict ranking (see Section D.15.4.3 for methods). The model indicates that for the length of the Interstate 8 Alternative through the Boulevard, La Posta, Guatay, and El Capitan Firesheds, 21% would present a very high conflict, 34% a high conflict, 22% a moderate conflict, and 10% a low conflict (Table E.1.15-15 and Figures E.1.15.20 through E.1.15.23). Three significant conflict areas are identified by the model, located at MP I8-41.5 to I8-43.5 in the Boulevard Fireshed, MP I8-44 to I8-47 on the border between the Boulevard and La Posta Firesheds, and I8-62 to I8-63.5 in the Guatay Fireshed.

Table E.1.15-15. Interstate 8 Alternative Wildfire Containment Conflict Summary

Fireshed	Low	Moderate	High	Very High
Boulevard	10%	17%	49%	24%
La Posta	13%	51%	23%	13%
Guatay	18%	14%	27%	41%
El Capitan	4%	19%	55%	22%
Route Summary	10%	22%	34%	21%

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Figure E.1.15-20. Boulevard Fireshed Interstate 8 Alternative Wildfire Containment Conflict Model

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Figure E.1.15-21. La Posta Fireshed Interstate 8 Alternative Wildfire Containment Conflict Model

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Figure E.1.15-22. Guatay Fireshed Interstate 8 Alternative Wildfire Containment Conflict Model
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Figure E.1.15-23. El Capitan Fireshed Interstate 8 Alternative Wildfire Containment Conflict Model

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Construction Impacts

Impact F-1: Construction and/or maintenance activities would significantly increase the probability of a wildfire (Class I)

Construction activities associated with the Interstate 8 Alternative would include, but not be limited to, use of heavy equipment for vegetation removal and grading, the construction of transmission tower pads and towers, and the installation of conductors. Additional heavy equipment, vehicles and tools would be used for the construction of staging areas, the Interstate 8 Alternative Substation, and many miles of new roads. The use of construction equipment such as earth movers, generators, vehicles, or chain-saws along with the personnel required to construct the transmission line introduces the potential for a variety of wildfire ignition sources to surrounding vegetation fuels or combustible materials associated with project construction. Construction-related ignitions within the Interstate 8 corridor have the potential to escape initial attack containment and become catastrophic fires. The areas with heavy fire fuels, steep topography, and exposure to Santa Ana winds would have a higher burn probability and a higher potential for an ignition to escape.

A total of 49.5 miles of new overhead transmission corridor are proposed to be built along the Interstate 8 Alternative route. Transmission line maintenance activities would include the periodic use of vehicles and presence of personnel for line inspections, and could also include the use of heavy equipment for conductor repairs or replacement. These activities would be far less intensive than construction activities; however, they would recur periodically over the life of the project, supplying an ongoing source of ignitions for 50 years or more.

The Burn Probability Model for the Interstate 8 Alternative (Figures E.1.15-12 through E.1.15-13) indicates that along the length of the Interstate 8 Alternative, a total of 10% of the border zone area has a high to very high probability of wildfire recurrence. A random fire ignition within the Interstate 8 Alternative corridor would burn primarily within the border zone and spread further into the wildland fuels of CNF and El Capitan County Preserve under normal weather conditions, putting 52 homes and 25,954 acres at risk in two burn periods. The potential area burned would be almost four times greater during extreme fire weather conditions resulting in widespread impacts (Figures E.1.15-16 through E.1.15-19), putting 657 homes and 96,815 acres at risk in two burn periods. In the Boulevard, La Posta, Guatay, and El Capitan Firesheds, there is an extensive WUI developed at a fairly high population density. The Boulevard and La Posta Firesheds are considered moderate-risk firesheds based on wildfire history and fuels present, and the Guatay and El Capitan Firesheds are considered high-risk firesheds based on wildfire history and fuels present. However, in all four firesheds, there is a substantial number of assets at risk due to development at the WUI, rendering all four firesheds extremely high-risk firesheds. Even a very small increase in wildfire frequency can have enormously damaging consequences in both normal and extreme weather conditions. The impact of project construction on the potential for a wildfire to have damaging consequences to the community, firefighter health and safety, and natural resources is considered significant, and it cannot be mitigated to a level that is less than significant.

This risk of ignition during normal and extreme weather and the risk of damage to structures can be reduced, although not to a level that is less than significant, through the implementation of Mitigation Measures F-1a, Develop and implement a Construction Fire Plan, F-1b, Finalize and implement SDG&E 2006 Draft Fire Plan for Electric Standard Practice, F-1c, Ensure coordination for emergency fire suppression, F-1d, Remove hazards from the work area, and F-1e, Contribute to defensible space grants fund.

Mitigation Measures F-1a, Develop and implement a Construction Fire Plan, and F-1b, Finalize and implement SDG&E 2006 Draft Fire Plan for Electric Standard Practice, would reduce the number of project-related ignitions in this fireshed by requiring personnel training, fire risk management oversight, and open communications with fire agencies. These measures would also reduce the potential impact to communities and natural resources by prohibiting project construction and maintenance activities during Red Flag Warning events, as issued by the National Weather Service, which would eliminate work during extreme fire weather and have the effect of substantially reducing the potential acres burned (from more than 96,815 acres to approximately 25,954 acres) but only minimally reducing the number of homes at risk (from more than 657 to approximately 52) in this fireshed. Combined with Mitigation Measure F-1e, described below, this measure would slightly reduce the risk of homes sustaining damage in a project construction- or maintenance-related fire, although not to a level that is less than significant.

Mitigation Measure F-1c, Ensure coordination for emergency fire suppression, ensures open communication channels and unobstructed emergency access roads. This measure would reduce firefighting response time in the event of an ignition, which would have the effect of reducing the potential impact to communities and natural resources.

Mitigation Measure F-1d, Remove hazards from the work area, would reduce the severity of construction- and maintenance-related ignitions that escape initial containment efforts by minimizing fuel loads within the corridor. This would reduce the potential impact to communities and natural resources in the event of a project construction- or maintenance-related ignition.

Mitigation Measure F-1e, Contribute to defensible space grants fund, would facilitate firefighting efforts and reduce structure damage at the WUI by making financial contributions toward compliance with defensible space requirements for homeowners most at risk of sustaining structure damage as a result of a project-related wildfire. The full text of all mitigation measures can be found in Appendix 12.

Mitigation Measures for Impact F-1: Construction and/or maintenance activities would significantly increase the probability of a wildfire

- F-1a Develop and implement a Construction Fire Prevention Plan.**
- F-1b Finalize and implement SDG&E 2006 Draft Fire Plan for Electric Standard Practice.**
- F-1c Ensure coordination for emergency fire suppression.**
- F-1d Remove hazards from the work area.**
- F-1e Contribute to defensible space grants fund.**

Operational Impacts

Impact F-2: Presence of the overhead transmission line would increase the probability of a wildfire (Class I)

The presence of the overhead transmission line would create an ongoing source of potential wildfire ignitions for the life of the project. Line faults can be caused by such unpredictable events as conductor contact by floating debris, gun shots, and helicopter collisions; these events are rare but would be unavoidable. The Boulevard and La Posta Firesheds have experienced a moderate cumulative number of acres burned over the last 50 years, and the Guatay and El Capitan Firesheds have experienced a higher cumulative number of acres burned in 50 years. The El Capitan Fireshed has experienced a high number of major events over the same time period. Chaparral fuels become denser in these four firesheds from east to west, and any line faults that create sparks or ignite nearby vegetation could result in a large and

catastrophic wildfire, putting 657 or more households and 96,815 or more acres at risk (see Fire Behavior Trend Model results, above) if transmission line ignitions were to occur during extreme weather conditions.

Impact F-2 is considered a significant impact because certain ignition sources are unavoidable. Due to the potential for unavoidable ignitions related to the presence of the overhead transmission line to occur during extreme fire weather, the presence of the project would significantly increase the likelihood of a catastrophic wildfire (Class I). The risk of ignitions and the risk of damage from a project-related ignition can be reduced, though not to a level that is less than significant, through implementation of adequate line clearances and by aiding in the creation of defensible space around homes at the WUI.

Mitigation Measure F-2a, Establish and maintain adequate line clearances, would reduce the risk of vegetation contact with conductors. This measure requires a higher performance standard than the CPUC's GO 95 (See Section D.15.3.2) justified by the regular occurrence in this area of extreme Santa Ana winds that have enough force to blow trees into conductors.

Mitigation Measure F-1e, Contribute to defensible space grants fund, would reduce the potential damage to homes from project-related wildfires; however, the creation of defensible space would not guarantee structure protection during severe fire weather, and the potential for the project to ignite a catastrophic wildfire would remain significant overall.

Mitigation Measures for Impact F-2: Presence of the overhead transmission line would increase the probability of a wildfire

F-2a Establish and maintain adequate line clearances.

F-1e Contribute to defensible space grants fund.

Impact F-3: Presence of the overhead transmission line would reduce the effectiveness of firefighting (Class I)

Aerial and ground-based firefighting efforts would be compromised by the introduction of an overhead transmission line due to the introduction of various hazards as identified in the Wildfire Containment Conflict Model results, including increasing the risk of transmission line contact by aircraft or water buckets, creating indefensible landscapes, and obstructing historical fire containment boundaries.

The Wildfire Containment Conflict Model (Figures E.1.15-20 through E.1.15-23) for the Interstate 8 Alternative identifies three specific areas where the overhead transmission line would restrict wildfire containment to a very high degree. The conflict areas are located at MP I8-41.5 to I8-43.5 in the Boulevard Fireshed, MP I8-44 to I8-47 on the border between the Boulevard and La Posta Firesheds, and I8-62 to I8-63.5 in the Guatay Fireshed in a high fire risk area with heavy fuels and historical fire containment boundaries. The nearby access roads and moderate topography indicate that the conflict exists in a defensible landscape where firefighting resources would be able to access and suppress a fire if there were no obstacles present. However, effective wildfire containment in this area would be obstructed by the presence of the overhead transmission line and the proximity of parallel existing lines. Firefighting suppression tactics, maneuverability and approach distances are greatly restricted by the indefensible island created between collocated and parallel transmission lines. This indefensible landscape is a swath of land where firefighting is tactically very difficult or simply too dangerous (due to a combination of minimum approach distances and rates of wildfire spread that can reach up to 300 feet per minute).

The outcome of not fighting a wildfire in an otherwise defensible landscape under favorable weather conditions is that it is able to build in size and intensity unchecked by firefighters who are forced to wait until the fire passes through the area. Delays in containment allow for rapid fire perimeter growth. With the increase in the fire perimeter comes the potential for wind-blown embers to ignite spot fires ahead of the fire front, which further complicates fire suppression activities. The creation of wildfire containment conflict areas by the Interstate 8 Alternative is considered a significant impact (Class I). This impact can be partially mitigated by creating fuelbreaks in the very high conflict areas to reduce wildfire intensity and rate of spread through these critical areas, which serves to increase the chance of success in containment efforts. Mitigation Measure F-3a, Construct and maintain fuelbreaks, is therefore required. Further benefits to firefighting efforts would be achieved, although not to the point of insignificance, through implementation of Mitigation Measure F-3b, Prepare and implement a multi-agency Fire Prevention MOU, which requires coordination of firefighting efforts with fire agencies. However, even with mitigation, the impact remains significant (Class I).

Mitigation Measures for Impact F-3: Presence of the overhead transmission line would reduce the effectiveness of firefighting

F-3a Construct and maintain fuelbreaks.

F-3b Prepare and implement a Multi-agency Fire Prevention MOU.

Impact F-4: Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread (Class II)

Project activities create the potential for the introduction and spread of non-native, invasive plants. Non-native plants are often spread by human and vehicle vectors in areas of large-scale soil disturbance and importation. These actions along with the opening of the vegetation canopy through the clearing of trees and shrubs involved with the construction and maintenance of the Proposed Project will contribute to the introduction and proliferation of non-native, invasive plants. Certain invasive plants, like cheatgrass, medusa head and Saharan mustard, can contribute to changes in wildfire frequency, timing and spread (Cal-IPC, 2007). Cheatgrass and medusa head, for example, dry out earlier in the season than native grasses creating fine fuels that are easily ignited. These fine fuels contribute to wildfires igniting earlier in the year and an increased level of fire recurrence. In addition, non-native grasslands have a “spotting” effect during a wildfire, where embers from these grasslands are blown ahead of the fire line, contributing to an increased rate of fire spread. Invasive annual grasses also influence fire spread by creating a fine fuel continuum between patchy, perennial shrubs allowing wildfires to expand further into otherwise sparsely vegetated wildlands (USGS, 2007). Saharan mustard creates dense stands of dry vegetation in desert scrub and coastal sage scrub communities which increases the fire fuels in these otherwise low fire risk areas (Cal-IPC, 2007). The introduction and spread of specific invasive plants within the Proposed Project ROW will adversely influence fire behavior by increasing the fuel load, fire frequency and fire spread.

The introduction of non-native plants with an increased ignition potential and rate of wildfire spread is considered a significant impact (Class II) that can be mitigated by following the prevention and management protocol outlined in Mitigation Measure B-3a, Prepare and Implement a Weed Control Plan. The Weed Control Plan requires pre-construction and long-term weed surveys and implementation of control methods that require consultation and approval of the San Diego County Agriculture Commissioner and appropriate land-holding public agencies. Invasive weeds that influence wildfire behavior are considered a high control priority (such as cheatgrass [*Bromus tectorum*], Saharan mustard [*Brassica tournefortii*] and medusa head [*Taeniatherum caput-medusae*]) along with the priority species determined by the San Diego County Agriculture Commissioner and the California Invasive Plant Council (Cal-IPC,

2007). This measure also requires that proper actions are taken to prevent the introduction of invasive plants through materials and equipment used for the construction and maintenance of the Interstate 8 Alternative transmission line.

Mitigation Measure for Impact F-4: Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread

B-3a Prepare and implement a Weed Control Plan.

E.1.15.3 Interstate 8 Alternative Substation

The Interstate 8 Alternative Substation would be a required component of the Interstate 8 Alternative. It would be located at MP 18-65 in the Guatay Fireshed (see Figure E.1.1-3). Impacts for this substation are included in the analysis of the Interstate 8 Alternative, above.

E.1.15.4 Interstate 8 Route Options

Campo North Option

The Campo North Option would be a 1.4-mile-long overhead segment in the La Posta Fireshed that would allow the Interstate 8 Alternative to bypass the Campo Reservation by rerouting the alternative north of the interstate highway (see Figure E.1.15-1). Wildfire modeling was not carried out for this option due to its short length and similarity to the Interstate 8 Alternative. Selection of this option would not change the severity of any of the impacts for the Interstate 8 Alternative, above, because the Campo North Option would not change the level of construction or maintenance activities (Impact F-1), the length of overhead transmission line (Impact F-2), the degree of conflict with firefighting operations (Impact F-3), nor the likelihood of introducing non-native plants to the work area (Impact F-4).

Buckman Springs Underground Option

The Buckman Springs Underground Option would place the Interstate 8 Alternative underground for 2.7 miles through the La Posta Fireshed (see Figure E.1.15-1). The Burn Probability model is carried out for this option to compare the burn probability of this option to the segment of the Interstate 8 Alternative that it would replace. Further wildfire modeling is not carried out for this option due to its location underground.

Burn Probability Model Results

The model output indicates that 3% of the border zone area has a high burn probability, 14% has a moderate burn probability, and 83% has a low burn probability (Figure E.1.15-24). The majority of the moderate to high burn probability areas occur where the corridor crosses the fuel-laden areas of Cleveland National Forest. (Figure E.1.15-25; see D.15.4.3 for methods). The moderate to very high burn probability areas occur where the corridor crosses the fuel-laden wildlands of Cleveland National Forest.

Environmental Impacts and Mitigation Measures: Buckman Springs Underground Option

Selection of this option would eliminate the possibility that the presence of the overhead transmission line would ignite a catastrophic fire (Impact F-2) for the segment it would replace, but not to a less than significant degree due to the short length of undergrounding relative to the length of the Interstate 8 Alternative to which it would connect. Selection of this option would not change the level of construction or maintenance activities (Impact F-1) nor the likelihood of introducing non-native plants to the work area (Impact F-4). This option would slightly reduce conflicts with wildfire containment efforts (F-3), although not to a less than significant degree. Because this option would not place the Interstate 8 Alternative underground in any of the three areas of significant wildfire containment conflict (see Wildfire Containment Conflict model results, above), the Buckman Springs Underground Option would not significantly reduce the degree of conflict with firefighting operations.

West Buckman Springs Option

The West Buckman Springs Option would be a 5.6-mile overhead transmission line through the La Posta Fireshed that would replace an overhead portion of the Interstate 8 Alternative from MP I8-53.6 to I8-58.5 (see Figure E.1.15-1).

Wildfire Model Results

Burn Probability Model Results

The Burn Probability model output indicates that 7% of the border zone area has a very high burn probability, 23% has a high burn probability, 25% has a moderate burn probability, and 45% has a low burn probability (Figure E.1.15-25; see D.15.4.3 for methods). The moderate to very high burn probability areas occur where the corridor crosses the fuel-laden wildlands of Cleveland National Forest.

Fire Behavior Trend Model Results

The Fire Behavior Trend model indicates that during normal weather conditions, ignitions started in the corridor would burn primarily within the half mile border zone. The presence of heavy wildland fuels would allow a fire to burn outside of the border zone between MP BSW-3 and BSW-5 toward the east into the private lands around Buckman Springs and Boulder Oaks, putting zero homes and as many as 1,762 acres at risk in two burn periods. Four cell towers would be potentially threatened by a wildfire in this region, reducing means of communication. Figure E.1.15-26 shows the fire behavior trend during normal weather conditions (Map A) compared to the fire behavior trend during extreme fire weather conditions (Map B) for the West Buckman Springs Alternative.

Under extreme fire weather conditions, a fire started within the transmission corridor would burn outside of the border zone towards the southwest through the fuel-laden wildlands of Cleveland National Forest. The Santa Ana Winds would potentially push the fire away from the rural communities of Boulder Oaks and Buckman Springs to the east of the transmission corridor. One cell tower would be threatened by a wildfire in this region, reducing means of communication. The potential burn area from a wildfire started along the West Buckman Springs Alternative would be almost four times greater during extreme Santa Ana weather conditions compared to normal conditions, likely putting zero homes and 6,893 acres at risk during two burn periods.

Figure E.1.15-24. La Posta Fireshed Buckman Springs Underground Option Burn Probability Model

[CLICK HERE TO VIEW](#)

Figure E.1.15-25. La Posta Fireshed West Buckman Springs Option Burn Probability Model
[CLICK HERE TO VIEW](#)

Wildfire Containment Conflict Model Results

Tactical firefighting management decisions made during wildfires are based on assessment of fire behavior and the ability of ground and aerial firefighters to safely attack a fire. The Wildfire Containment Conflict Model is used to identify areas along the transmission line where significant conflicts with wildfire suppression efforts would be created by the introduction of the proposed overhead transmission line, defined as segments with at least 1.5 consecutive miles of very high conflict ranking (see Section D.15.4.3 for methods). The model indicates that for the length of the West Buckman Springs Option through the La Posta Fireshed, 14% would present a very high conflict, 23% a high conflict, 49% a moderate conflict, and 14% a low conflict (Figure E.1.15-27). No significant conflict areas are identified by the model due to the location of the option through a largely indefensible landscape with steep topography and abundant fuels.

Environmental Impacts and Mitigation Measures: West Buckman Springs Option

Selection of this option would not change the severity of any of the impacts for the Interstate 8 Alternative, above, because the West Buckman Springs Option would not change the level of construction or maintenance activities (Impact F-1), the length of overhead transmission line (Impact F-2), the degree of conflict with firefighting operations (Impact F-3), nor the likelihood of introducing non-native plants to the work area (Impact F-4).

South Buckman Springs Option

The South Buckman Springs Option would be a 4.1-mile overhead transmission line through the La Posta Fireshed that would connect the Modified Route D Alternative (for a description of this alternative, see Section E.4.1, and for Fire and Fuels setting and impacts, see Section E.4.15) to the West Buckman Springs Option of the Interstate 8 Alternative between MP MRD-4.5 and MP BSW-1.7 This route option is shown in detail on Figure E.1.1-4c and regionally on Figure E.1.15-1. Wildfire modeling was not carried out for this option due to its short length and similarity to the West Buckman Springs Option. Selection of this option would not change the severity of any of the impacts for the Interstate 8 Alternative or the West Buckman Springs Option, above, because the South Buckman Springs Option would not change the level of construction or maintenance activities (Impact F-1), the length of overhead transmission line (Impact F-2), the degree of conflict with firefighting operations (Impact F-3), nor the likelihood of introducing non-native plants to the work area (Impact F-4).

Chocolate Canyon Option

The Chocolate Canyon Option would be 3.6 miles overhead and 0.1 miles underground through the El Capitan Fireshed. It would replace the Interstate 8 Alternative from MP I8-79.7 to I8-82.2. Selection of this option would slightly change the severity of two of the impacts for the Interstate 8 Alternative, above, because the Chocolate Canyon Option would slightly increase the level of construction and maintenance activities (Impact F-1), and slightly increase the length of overhead transmission line (Impact F-2), although the significance of these impacts would not change. This option would not change the degree of conflict with firefighting operations (Impact F-3), nor the likelihood of introducing non-native plants to the work area (Impact F-4).

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Figure E.1.15-26. La Posta Fireshed West Buckman Springs Option Fire Behavior Trend Model
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Figure E.1.15-27. La Posta Fireshed West Buckman Springs Option Wildfire Containment
Conflict Model

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E.1.15.5 Future Transmission System Expansion for Interstate 8 Alternative

As described in Section E.1.1, the Interstate 8 Alternative Substation that would be built as a part of the Interstate 8 Alternative would accommodate up to six 230 kV circuits and a 500 kV circuit. Only two 230 kV circuits are proposed by this alternative at this time, but construction of additional 230 kV circuits and a 500 kV circuit out of the Interstate 8 Alternative Substation may be required in the future. This section considers the impacts of construction and operation of these potential future transmission lines. There are three routes that are most likely for these future lines; each is addressed below. Figure E.1.1-6 illustrates the potential routes of the transmission lines.

Environmental Setting: 230 kV and 500 kV Future Transmission System Expansion

The future 230 and/or 500 kV lines from the Interstate 8 Alternative Substation would most likely follow one or more of the following routes:

Interstate 8 Route Including Underground Within Alpine Boulevard

Please note the Interstate 8 route including underground within Alpine Boulevard would only be applicable for future 230 kV lines. Additional 230 kV circuits could be installed underground within Alpine Boulevard, with appropriate compact duct banks and engineering to avoid, or possibly relocate, existing utilities. See Section E.1.15.1 and E.1.15.2 for the environmental setting, impacts, and mitigation measures for Fire and Fuels Management for the Interstate 8 Alternative. The future transmission line route would follow the Interstate 8 Alternative's 230 kV route to the point where it meets the Proposed Project at MP 131. The future transmission route would then join the proposed route corridor to the west, continuing past the Sycamore Canyon Substation to the Chicarita Substation. See Sections D.15.2 and D.15.8 through D.15.11 for the environmental setting, impacts and mitigation measures for Fire and Fuels Management of the Inland Valley Link and the Coastal Link of the Proposed Project. The Interstate 8 230 kV future transmission route could then follow the Proposed Project's 230 kV Future Transmission Expansion route from Chicarita to the Escondido Substation shown in Figure B-12a. See Section D.15.13 for the environmental setting, impacts, and mitigation measures for the Proposed Project's Future Transmission Expansion route.

Route D Alternative Corridor

Additional 230 or 500 kV circuits could follow the Route D Alternative corridor to the north of Descanso, after following the Interstate 8 Alternative 230 kV route from the Interstate 8 Substation to MP I8 70.3. The environmental setting, impacts, and mitigation measures for Fire and Fuels Management of the Route D Alternative can be found in Section E.3.15.1 and in Section E.3.15.2. It should be noted however, that the Route D Alternative Noise impacts and mitigation measures are for a 500 kV transmission line, and the Interstate 8 future transmission line as detailed above could be either a 500 kV line or a 230 kV line.

The Route D corridor would connect with the Proposed Project corridor at Milepost 114.5, and could then follow either: (1) the Proposed Project southwest to the Chicarita Substation and then follow the Proposed Project's 230 kV Future Transmission Expansion route (see description in Section B.2.7) from Chicarita to the Escondido Substation; or (2) the Proposed Project northeast to the Proposed Central East Substation and then follow the Proposed Project's 500 kV Future Transmission Expansion route shown in Figure B-12b (see description in Section B.2.7) to connect with SCE's existing Serrano-

Valley 500 kV line in Riverside County. See Section D.15.2 for more information on the Fire and Fuels Management setting of the Central, Inland Valley, and Coastal Links of the Proposed Project.

For the Fire and Fuels Management setting, impacts, and mitigation measures of the Proposed Project's 230 kV Future Transmission Expansion route and the Proposed Project's 500 kV Future Transmission Expansion route see Section D.15.13.

Interstate 8 Alternative with Modified Route D alignment and West of Forest alignment

The future 230 or 500 kV lines could follow the proposed Interstate 8 Alternative route from the Interstate 8 Alternative Substation until reaching the Modified Route D Alternative corridor (within the 368 Corridor identified by the Department of Energy's Draft West-wide Corridor Programmatic EIS) and then follow the Modified Route D Alternative corridor south for 11 miles to MP MD-26. For the Fire and Fuels Management setting, impacts, and mitigation measures along the Modified Route D corridor see Section E.4.15.1 and E.4.15.2. At MP MD-26, new 230 or 500 kV circuits would turn west and connect with the northernmost segment of the West of Forest Alternative route as described in Section E.1.1. This route would meet up with the Interstate 8 Alternative at approximately MP I8-79 and would follow the Interstate 8 Alternative's overhead 230 kV route to the point where it meets the Proposed Project at MP 131. The future transmission route would then join the proposed route corridor to the west, continuing past the Sycamore Canyon Substation to the Chicarita Substation. It could then follow the Proposed Project's 230 kV Future Transmission Expansion route (see description in Section B.2.7) from Chicarita to the Escondido Substation.

MP MD-26 to MP I8-79

The southern half of the future transmission alignment falls in the AFS-8 Dulzura Fireshed (refer to the discussion in Section E.4.15.1). A fireshed analysis was not performed for the middle section of the future transmission alignment, adjacent to Loveland Reservoir but it traverses a very high fire risk landscape as defined by CAL FIRE models (See Figure D.15-1). The future transmission alignment would fall in the AFS-4 El Capitan Fireshed, including the community of Harbison Canyon, prior to meeting up with MP I8-79 (refer to the discussion in Section E.1.15.1).

Environmental Impacts and Mitigation Measures: 230 or 500 kV Future Transmission System Expansion

Due to the similar high fire risk in the areas of the future 230 and 500 kV transmission lines, mitigation measures would be required similar to those recommended for the impacts analyzed for the Proposed Project transmission corridor. Additionally, the relevant APMs, which SDG&E has agreed to implement in the Sunrise Powerlink application, are not considered to be part of the potential future transmission line and are recommended as mitigation where required to reduce an otherwise significant impact.

Construction Impacts

Impact F-1: Construction and/or maintenance activities would significantly increase the probability of a wildfire (Class I)

Construction and maintenance activities associated with the future transmission lines would include, but not be limited to, use of heavy equipment for vegetation removal and grading, the construction of transmission tower pads and towers, and the installation of conductors. The use of construction equipment such as earth movers, generators, vehicles, or chainsaws along with the personnel required to construct

the transmission line introduces the potential for a variety of wildfire ignition sources to surrounding vegetation fuels or combustible materials associated with project construction. Construction- and maintenance-related ignitions within the future transmission alignment corridors have the potential to escape initial attack containment and become catastrophic fires. The areas with heavy fire fuels, steep topography, and exposure to Santa Ana winds would have a higher burn probability and a higher potential for an ignition to escape. The risk of a catastrophic fire being ignited by construction or maintenance of the future transmission alignment would be extremely high due to the transmission lines' location in extremely high fire risk landscapes, and because the transmission lines would traverse medium- and high-population-density WUI areas.

This risk can be reduced, although not to a level that is less than significant, through the implementation of Mitigation Measures F-1a, Develop and implement a Construction Fire Plan, F-1b, Finalize and implement SDG&E 2006 Draft Fire Plan for Electric Standard Practice, F-1c, Ensure coordination for emergency fire suppression, F-1d, Remove hazards from the work area, and F-1e, Contribute to defensible space grants fund.

Mitigation Measures F-1a, Develop and implement a Construction Fire Plan, and F-1b, Finalize and implement SDG&E 2006 Draft Fire Plan for Electric Standard Practice, would reduce the number of project-related ignitions in this fireshed by requiring personnel training, fire risk management oversight, and open communications with fire agencies. These measures would also reduce the potential impact to communities and natural resources by prohibiting project construction and maintenance activities during Red Flag Warning events, as issued by the National Weather Service, which would eliminate work during extreme fire weather and have the effect of reducing the potential acres burned and the number of homes at risk. Combined with Mitigation Measure F-1e, described below, this measure would reduce the risk of homes sustaining damage in a project construction- or maintenance-related fire, although not to a less than significant level.

Mitigation Measure F-1c, Ensure coordination for emergency fire suppression, ensures open communication channels and unobstructed emergency access roads. This measure would reduce firefighting response time in the event of an ignition, which would have the effect of reducing the potential impact to communities and natural resources.

Mitigation Measure F-1d, Remove hazards from the work area, would reduce the severity of construction- and maintenance-related ignitions that escape initial containment efforts by minimizing fuel loads within the corridor. This would reduce the potential impact to communities and natural resources in the event of a project construction- or maintenance-related ignition.

Mitigation Measure F-1e, Contribute to defensible space grants fund, would facilitate firefighting efforts and reduce structure damage at the WUI by making financial contributions toward compliance with defensible space requirements for homeowners most at risk of sustaining structure damage as a result of a project-related wildfire. The full text of all mitigation measures can be found in Appendix 12.

Despite implementation of these measures, the risk of an ignition erupting into a catastrophic event is still unacceptably high, and Impact F-1 would remain significant.

Mitigation Measures for Impact F-1: Construction and/or maintenance activities would significantly increase the probability of a wildfire

F-1a Develop and implement a Construction Fire Prevention Plan.

F-1b Finalize and implement SDG&E 2006 Draft Fire Plan for Electric Standard Practice.

- F-1c** **Ensure coordination for emergency fire suppression.**
- F-1d** **Remove hazards from the work area.**
- F-1e** **Contribute to defensible space grants fund.**

Operational Impacts

Impact F-2: Presence of the overhead transmission line would increase the probability of a wildfire (Class I)

The presence of the overhead transmission line would create an ongoing source of potential wildfire ignitions for the life of the project. Line faults can be caused by such unpredictable events as conductor contact by floating debris, gun shots, and helicopter collisions; these events are rare but would be unavoidable. The future transmission lines would traverse extremely high fire risk landscapes, and any line faults that create sparks or ignite nearby vegetation could result in a large and catastrophic wildfire, putting many acres and many homes at risk if transmission line ignitions were to occur during extreme weather conditions.

Impact F-2 is considered a significant impact because certain ignition sources are unavoidable. The risk of ignitions and the risk of damage from a project-related ignition can be reduced, though not to a level that is less than significant, through implementation of adequate line clearances and by aiding in the creation of defensible space around homes at the WUI. Due to the potential for unavoidable ignitions related to the presence of the overhead transmission line to occur during extreme fire weather, the presence of the project would significantly increase the likelihood of a catastrophic wildfire (Class I).

Mitigation Measure F-2a, Establish and maintain adequate line clearances, would reduce the risk of vegetation contact with conductors. This measure requires a higher performance standard than the CPUC's GO 95 (See Section D.15.3.2) justified by the regular occurrence in this area of extreme Santa Ana winds that have enough force to blow trees into conductors.

Mitigation Measure F-1e, Contribute to defensible space grants fund, would reduce the potential damage to homes from project-related wildfires; however, the creation of defensible space would not guarantee structure protection during severe fire weather, and the potential for the project to ignite a catastrophic wildfire would remain significant overall.

Mitigation Measures for Impact F-2: Presence of the overhead transmission line would increase the probability of a wildfire

- F-2a** **Establish and maintain adequate line clearances.**
- F-1e** **Contribute to defensible space grants fund.**

Impact F-3: Presence of the overhead transmission line would reduce the effectiveness of firefighting (Class I)

For future transmission line segments the potential creation of obstacles to wildfire containment by firefighters would be significant (Class I). This impact can be partially mitigated by creating fuelbreaks in the very high conflict areas to reduce wildfire intensity and rate of spread through these critical areas, which serves to increase the chance of success in containment efforts. Mitigation Measure F-3a, Construct and maintain fuelbreaks, is therefore required, and should the future transmission lines be constructed, wildfire containment conflict modeling would be required to be carried out by SDG&E to determine areas of significant conflict. Further benefits to firefighting efforts would be achieved, although not to the point of insignifi-

cance, through implementation of Mitigation Measure F-3b, Prepare and implement a multi-agency Fire Prevention MOU, which requires coordination of firefighting efforts with fire agencies. However, even with mitigation, the impact remains significant (Class I).

Mitigation Measures for Impact F-3: Presence of the overhead transmission line would reduce the effectiveness of firefighting

F-3a Construct and maintain fuelbreaks.

F-3b Prepare and implement a Multi-agency Fire Prevention MOU.

Impact F-4: Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread (Class II)

Project activities create the potential for the introduction and spread of non-native, invasive plants. Non-native plants are often spread by human and vehicle vectors in areas of large-scale soil disturbance and importation. These actions along with the opening of the vegetation canopy through the clearing of trees and shrubs involved with the construction and maintenance of the future transmission lines will contribute to the introduction and proliferation of non-native, invasive plants. Certain invasive plants, like cheatgrass, medusa head and Saharan mustard, can contribute to changes in wildfire frequency, timing and spread (Cal-IPC, 2007). Cheatgrass and medusa head, for example, dry out earlier in the season than native grasses creating fine fuels that are easily ignited. These fine fuels contribute to wildfires igniting earlier in the year and an increased level of fire recurrence. In addition, non-native grasslands have a “spotting” effect during a wildfire, where embers from these grasslands are blown ahead of the fire line, contributing to an increased rate of fire spread. Invasive annual grasses also influence fire spread by creating a fine fuel continuum between patchy, perennial shrubs allowing wildfires to expand further into otherwise sparsely vegetated wildlands (USGS, 2007). Saharan mustard creates dense stands of dry vegetation in desert scrub and coastal sage scrub communities which increases the fire fuels in these otherwise low fire risk areas (Cal-IPC, 2007). The introduction and spread of specific invasive plants within the future transmission ROWs will adversely influence fire behavior by increasing fuel load, fire frequency, and fire spread.

The introduction of non-native plants with an increased ignition potential and rate of wildfire spread is considered a significant impact (Class II) that can be mitigated by following the prevention and management protocol outlined in Mitigation Measure B-3a, Prepare and Implement a Weed Control Plan. The Weed Control Plan requires pre-construction and long-term weed surveys and implementation of control methods that require consultation and approval of the San Diego County Agriculture Commissioner and appropriate land-holding public agencies. Invasive weeds that influence wildfire behavior are considered a high control priority (such as cheatgrass [*Bromus tectorum*], Saharan mustard [*Brassica tournefortii*] and medusa head [*Taeniatherum caput-medusae*]) along with the priority species determined by the San Diego County Agriculture Commissioner and the California Invasive Plant Council (Cal-IPC, 2007). This measure also requires that proper actions are taken to prevent the introduction of invasive plants through materials and equipment used for construction and maintenance of the transmission lines.

Mitigation Measure for Impact F-4: Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread

B-3a Prepare and implement a Weed Control Plan.