# E.4.15 Fire and Fuels Management

A firesheld 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 Modified Route D Alternative are described in Sections E.1.15.1 and E.4.15.1, and environmental impacts and mitigation measures for the Modified Route D Alternative are presented in Section E.4.15.2. Section E.4.15.3 presents modeling results, environmental impacts, and mitigation measures for the Star Valley Option. The environmental setting presented in Section E.4.15.1, below, is applicable to this route option and alternative substation. 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 below summarize the results of fireshed modeling.

## E.4.15.1 Environmental Setting

The Modified Route D Alternative route is described in Section E.4.1. It includes three main segments: a southwesterly segment that crosses BLM, CNF and private lands before reaching the Cameron Substation, a westerly segment that follows the southern boundary of the CNF, and a northerly segment that is primarily on CNF land and includes the Modified Route D Substation.

The Modified Route D Alternative passes through four firesheds: the La Posta Fireshed (described in Section E.1.15.1), the Campo Fireshed (described below), the Dulzura Fireshed (described below), and the Guatay Fireshed (described in Section E.1.15.1). Figure E.4.15-1 shows the Modified Route D Alternative through the La Posta, Campo, Dulzura, and Guatay Firesheds.

### Campo Fireshed (AFS-7)

**Total Assessment Area: 67,062 acres**

The Campo Fireshed is located within the south central part of San Diego County near the Mexico border, and would include 11.5 miles of Modified Route D overhead transmission line. The fireshed includes the communities of Campo, Potrero, Morena Village, and Cameron Corners, all of which are federally registered communities at risk of wildfire. The fireshed includes the Pine Creek and Hauser Wilderness Areas which are part of the Cleveland National Forest. This is a mountainous area with a number of granite boulder strewn peaks and deep valleys. The elevation ranges from 4,657 feet on Corte Madera Mountain to 2,323 feet in Potrero. The average annual rainfall in this fireshed ranges from 22 inches in the northern high elevation areas to 18 inches in the south.

The majority of this fireshed consists of federally administered public lands with Cleveland NF in the north and BLM lands in the south (Table E.4.15-1). The private land is centered around Highway 94 and to the south of Lake Morena with in-holdings interspersed throughout the public lands. The average parcel size is 13 acres, indicating development potential within the private lands. The population density on

private lands is 160 people per square mile. Future population growth within the Campo 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 an Intermix WUI[1] region where there is a high level of human activity around and within the wildlands and the intermediate scale of development has fragmented the wildlands but not enough to disrupt the spread of wildfires (Syphard et al., 2007).

Table E.4.15-1. Land Ownership Summary of Campo Fireshed

| Ownership | Acres | Portion of Fireshed |
|---|---|---|
| City of SD | 3,633 | 5% |
| County of SD | 294 | <1% |
| BLM | 13,589 | 20% |
| USFS | 27,382 | 41% |
| Military | 0 | 0% |
| Native American Reservation | 604 | 1% |
| State of CA | 4 | <1% |
| SDG&E | 0 | 0% |
| Other (private, etc.) | 21,556 | 32% |
| Total | 67,062 | 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: 3 fires/50 years.**
**Major events (over 1,000 acres): 4 fires/50 years.**
**Total acres burned: 53,100 acres/50 years.**

The largest fire to occur in the Campo Fireshed was the 1970 Laguna Fire which burned through the northern half of the region. The 2006 Horse Fire burned 12,857 acres within the fireshed around Lake Morena and further to the west. The 2007 Harris Fire burned 3,096 acres within the western portion of the fireshed.

Most ignitions in this fireshed occur in remote canyons, especially the area immediately north of the Modified Route D Alternative between Barrett Lake and Lake Morena. Campfires present a significant source of ignitions over the past 13 years (32%) (Figure E.4.15-2). The majority of these campfire ignitions have been caused by recreational campfires around the Corral Canyon Off Road Vehicle Area and illegal immigrant campfires in more remote areas of the CNF.

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 4% 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 29 of the 38 wildfires that burned within the fireshed, lightning started 2 wildfires and the rest of the wildfire sources were undetermined. The 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.

[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))

Figure E.4.15-1. Modified Route D Alternative Overview Map
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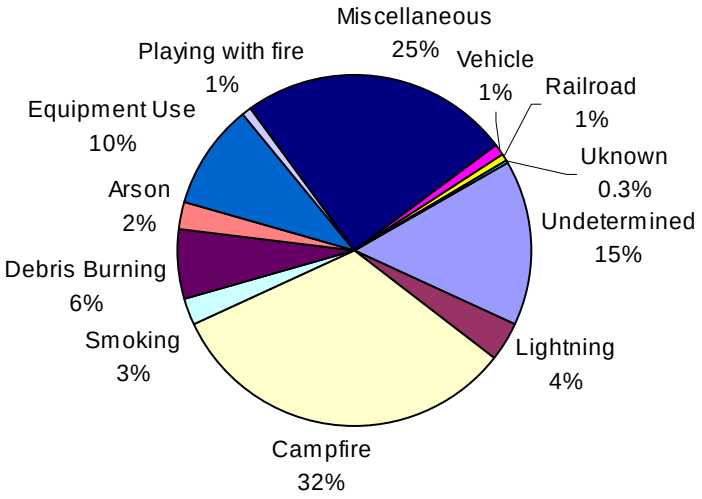
Figure E.4.15-2. Reported 13-Year Wildfire Ignition History in Alternative Route Campo Fireshed

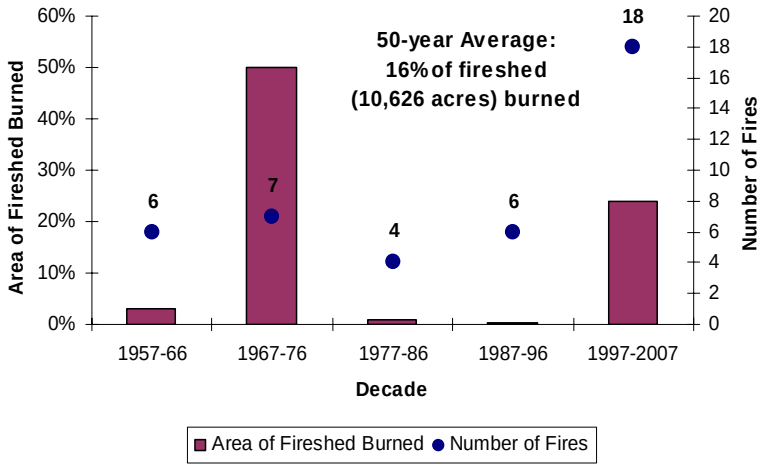
| Cause | Number of Ignitions |
|---|---|
| Undetermined | 54 |
| Lightning | 13 |
| Campfire | 116 |
| Smoking | 9 |
| Debris Burning | 23 |
| Arson | 8 |
| Equipment Use | 35 |
| Playing with fire | 3 |
| Miscellaneous | 88 |
| Vehicle | 4 |
| Railroad | 2 |
| Unknown | 1 |
| Total | 356 |




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

An average of 16% or 10,626 acres burned per decade in the Campo Fireshed based on the 50-year fire records (Figure E.4.15-3; for methods see Section D.15.4.3). After the 1970 Laguna Fire, which burned 27,251 acres within the fireshed, the average acreage burned decreased in the following two decades. In the past decade, there has been a dramatic increase in the number of wildfires due in particular to the 2006 Horse and 2007 Witch Fires

Figure E.4.15-3. Campo Fireshed 50-Year Wildfire History




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

### *Vegetation*

Similar to the Dulzura Fireshed, this fireshed is dominated by dense chaparral, most of which is over 35 years old. A tremendous amount of dead fuels are present due to persistent drought conditions over the past ten years. During the summer of 2007 significant numbers of scrub oak, bush penstemon, ceanothus, and chamise shrubs have experienced extreme drought stress. This dry fuel load creates extremely hazardous fire conditions. See Table E.4.15-2 for a complete vegetation summary.

Table E.4.15-2. Vegetation Composition of Campo Fireshed

| Vegetation Type | Acres | Cover |
|---|---|---|
| Chaparral | 2,777 | 77% |
| Live Oak | 195 | 5% |
| Scrub | 35 | 1% |
| Out Area | 587 | 16% |
| Total | 3,594 | 100% |

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

### *Fire Prevention Practices & Resources*

The northern half of the fireshed is primarily Cleveland National Forest where USFS has the primary responsibility for fire suppression in that area. The responsibility for fire suppression and prevention in the southern half of this fireshed is divided between the San Diego Rural Fire Protection District (SDRFP) and the California Department of Forestry and Fire Protection (CAL FIRE). SDRFP has two part time stations. CAL FIRE has seasonal stations in Potrero and Campo. Water sources are available at Lake Morena. The communities of Lake Morena Village, Potrero, Campo, and Cameron Corners have been federally designated as communities at risk of wildfire.

## Dulzura Fireshed (AFS-8)

**Total Assessment Area: 66,094 acres**

The Dulzura Fireshed is located within the south central part of San Diego County near the Mexico border and includes the communities of Dulzura and Engineer Springs. The fireshed would include 13.9 miles of Modified Route D overhead transmission corridor. State Highway 94 borders the southern and southwestern portion. The elevation ranges from 1,045 feet at Dulzura to 3,720 feet on Lyon Peak. The average annual rainfall ranges from 18 inches in the south and west portions of the fireshed to 22 inches per year in the central and north east sections. The precipitation increase is experienced in the mountainous regions of the Cleveland National Forest Wilderness Areas. This amount of precipitation allows the growth of dense chaparral vegetation especially on north facing slopes.

Although most of this fireshed is privately owned (54%) it has remained relatively undeveloped (Table E.4.15-3). Public wildlands make up a substantial portion of the area consisting of Cleveland National Forest– and BLM-administered lands. The mean average parcel size is 16 acres which indicates that there is development potential within the private lands. The population density within the private lands is 58 people per square mile. Potential future population growth within the Dulzura Fireshed will be concentrated within these private land-holdings which will increase the human influence on the surrounding wildlands thereby expanding the Wildland-Urban Interface (WUI). This fireshed is categorized as an Intermix WUI[2] region where there is a high level of human activity around and within the wildlands and the intermediate scale of development has fragmented the wildlands but not enough to disrupt the spread of wildfires (Syphard et al., 2007).

Table E.4.15-3. Land Ownership Summary of Dulzura Fireshed

| Ownership | Acres | Portion of Fireshed |
|---|---|---|
| City of SD | 4935 | 7% |
| County of SD | 599 | 1% |
| BLM | 7484 | 11% |
| USFS | 16381 | 25% |
| Military | 0 | 0% |
| Native American Reservation | 0 | 0% |
| State of CA | 1148 | 2% |
| SDG&E | 50 | <1% |
| Other (private, etc.) | 35497 | 54% |
| Total | 66094 | 100% |

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

[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))

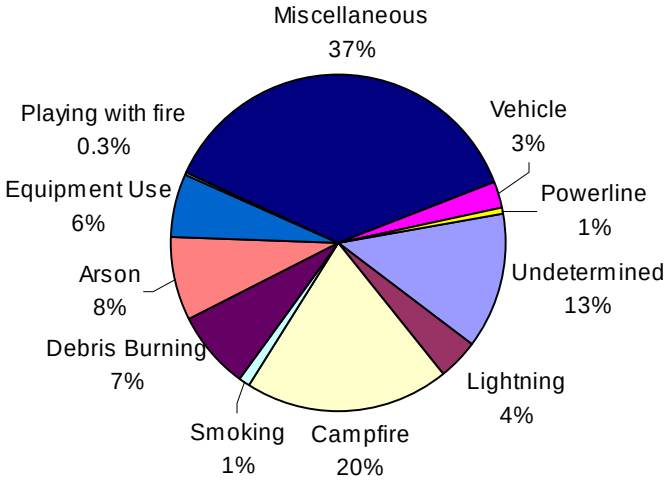
### *Fire History*

**Fire frequency: 50 recorded fires/50 years.**
**Extended attack between 500 – 1,000 acres: 3 fires/50 years.**
**Major events (over 1,000 acres): 3 fires/50 years.**
**Total acres burned: 86,200 acres/50 years.**

The largest wildfire to burn within this fireshed was the 1970 Laguna Fire which burned 42,716 acres through all but the lower southeastern quarter of the fireshed area (65%). More recently, the Horse Fire burned 3,821 acres within the fireshed in 2006, and in October 2007 the Harris Fire burned 33,526 acres within the southern portion of the fireshed. Most ignitions in this fireshed occur in remote canyons, especially north of Barrett Lake. Similar to the Campo Fireshed, campfires present a significant source of ignitions over the 13-year history (20%) (Figure E.4.15-4). The majority of these have been started by illegal immigrant campfires, such as the 2006 Horse Fire. Arson ignited fires are prevalent within and adjacent to the Cleveland National Forest.

Figure E.4.15-4. Reported 13-Year Wildfire Ignition History in Alternative Route Dulzura Fireshed

| Cause | Number of Ignitions |
|---|---|
| Undetermined | 51 |
| Lightning | 15 |
| Campfire | 77 |
| Smoking | 5 |
| Debris Burning | 29 |
| Arson | 32 |
| Equipment Use | 23 |
| Playing with fire | 1 |
| Miscellaneous | 146 |
| Vehicle | 10 |
| Powerline | 2 |
| Total | 391 |




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

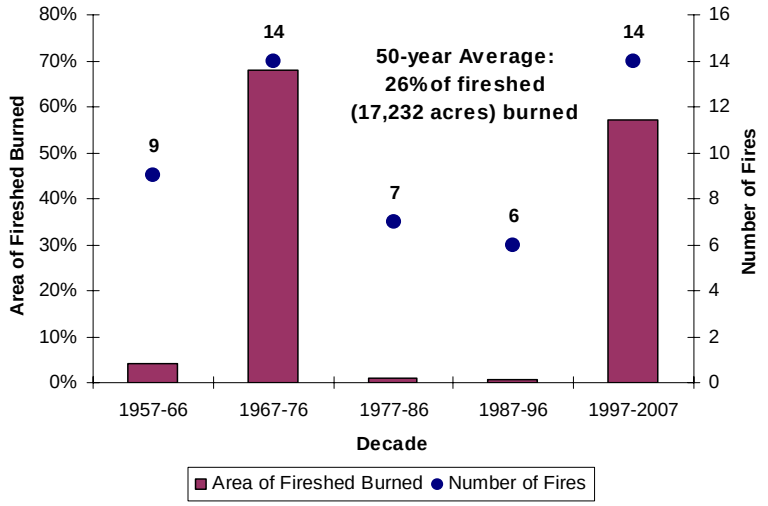
An average of 16% or 10,575 acres burned per decade in the Dulzura Fireshed based on the 50-year fire records (Figure E.4.15-5; for methods see Section D.15.1.2). The downward trend in the acreage burned indicates that after the 1970 Laguna Fire, which burned 42,716 acres within the fireshed, the average acreage burned decreased in the following two decades. The number of fires was highest during the 1967-76 and 1997-2007 decades.

The level of human influence within this fireshed is a key indicator of future wildfire ignitions. Humans are responsible for 83% of the wildfire ignitions over the past 13-years as compared to 4% 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 33 of the 49 wildfires that burned within the fireshed, lightning started 2 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*

Similar to the Campo Fireshed (described above), this fireshed is dominated by dense chaparral, most of which is over 35 years old. A tremendous amount of dead vegetation is present due to persistent drought conditions over the past ten years. During the summer of 2007 significant numbers of scrub oak, bush penstemon, ceanothus, and chamise shrubs have experienced extreme drought stress and appear to be dying. This dead fuel load creates extremely hazardous fire conditions. Due to the extensive fuels and topography in the northernmost part of the Dulzura Fireshed, it is likely that if a wildfire burned within this area it would be extremely difficult to contain. Table E.4.15-4 summarizes vegetation types in the Dulzura Fireshed.

Figure E.4.15-5. Dulzura Fireshed 50-Year Wildfire History




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

### *Fire Prevention Practices & Resources*

The responsibility for fire suppression and prevention in eastern portion of the Dulzura Fireshed is federal (USFS and BLM) the USFS operates one seasonal station. The responsibility for fire suppression in the western and southern portions of the fireshed is divided between the San Diego Rural Fire Protection District (SDRFP) and the California Department of Forestry and Fire Protection (CAL FIRE). SDRFP operates three part time stations and CAL FIRE operates two seasonal stations. Water sources are available at Barrett Lake. The community of Dulzura has been federally designated as a community at risk from wildfire.

Table E.4.15-4. Vegetation Composition of Dulzura Fireshed

| Vegetation Type | Acres | Cover |
|---|---|---|
| Chaparral | 3,800 | 85% |
| Live Oak | 115 | 3% |
| Oak Woodland | 173 | 4% |
| Scrub | 106 | 2% |
| Out Area | 270 | 6% |
| Total | 4,464 | 100% |

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

## E.4.15.2 Environmental Impacts and Mitigation Measures

Environmental impacts and mitigation measures are presented below for the Modified Route D Alternative. The objective of the mitigation measures, when applicable, is to reduce the impacts to a less than significant level. Due to the large scale of the Modified Route D Alternative and the very high fire risk in San Diego County three of these impacts are not mitigable to a less than significant level. Table E.4-15.5 summarizes the impacts of the Modified Route D Alternative in the area of fire and fuels management.

Table E.4.15-5. Impacts Identified – Modified Route D Alternative – Fire and Fuels Management

| Impact No. | Description | Impact Significance |
|---|---|---|
| Modified Route D Alternative (with or without Star Valley Option) | | |
| 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 Modified Route D 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 Modified Route D Alternative within the La Posta, Campo, Dulzura, and Guatay Firesheds is modeled to illustrate regions within the border zone that have a high potential to experience recurring wildfire events.

High fire probability areas within the half-mile-wide border zone of the Modified Route D Alternative were identified using the FlamMap Burn Probability Model. See Section D.15.1.3, Approach to Data Collection – Fire Behavior Models, for a description of the modeling analysis. Figures E.4.15-6 through E.4.15-9 show the relative burn probabilities for the Modified Route D Alternative within the La Posta, Campo, Dulzura, and Guatay Firesheds, respectively. The majority of high to very high burn probability areas occur where the corridor borders or crosses fuel-laden CNF and BLM lands. The model output for each fireshed and the entire route is summarized in Table E.4.15-6.

Table E.4.15-6. Modified Route D Alternative Burn Probability

| Fireshed | Low | Moderate | High | Very High |
|---|---|---|---|---|
| La Posta | 67% | 28% | 5% | 0% |
| Campo | 33% | 46% | 12% | 9% |
| Dulzura | 20% | 39% | 31% | 10% |
| Guatay | 20% | 43% | 14% | 23% |
| Route Summary | 32% | 40% | 19% | 9% |

Source: Forester's Co-Op Model Output

### Fire Behavior Trend Model

During normal weather conditions, ignitions along the transmission line would burn outside of the half-mile-wide border zone towards the east, putting 127 households and 24,877 acres at risk in two burn periods. A potential fire start in the corridor adjacent to dense vegetation could cause a fire to burn substantial areas of the Cleveland National Forest. Figures E.4.15-10 through E.4.15-13 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 the Modified Route D Alternative through the La Posta, Campo, Dulzura, and Guatay Firesheds, respectively. Table E.4.15-7 summarizes the Fire Behavior Trend Model results.

Under extreme weather conditions, ignitions along the transmission line would burn to the southwest, spreading through extensive areas of the CNF and BLM wildlands. The communities of Morena Village, Potrero, Dulzura, and other rural towns would be threatened by a fire start in the transmission corridor during extreme weather conditions. More than 882 homes and 129,534 acres would be at risk. The expansive wildlands in the area the route traverses provide continuous fuels for Santa Ana wind-driven fires. The potential area at risk of being consumed in a wildfire ignited along the Modified Route D transmission corridor in the La Posta Fireshed would be more than four times greater during extreme Santa Ana weather conditions compared to normal conditions. In the Campo Fireshed, the potential area at risk of burning would be five times greater during extreme Santa Ana weather conditions compared to normal conditions. In the Dulzura Fireshed, the potential area at risk of burning would be seven times greater during extreme Santa Ana weather conditions compared to normal conditions. In the Guatay Fireshed, the potential area at risk of burning would be three times greater during extreme Santa Ana weather conditions compared to normal conditions.

Table E.4.15-7. Modified Route D Alternative Fire Behavior Trend Model Summary

| | Normal Weather | | Extreme Weather | |
|---|---|---|---|---|
| Fireshed | Homes at Risk | Acres at Risk | Homes at Risk | Acres at Risk |
| La Posta | 11 | 3,821 | 91 | 14,132 |
| Campo | 13 | 7,683 | 146 | 37,665 |
| Dulzura | 72 | 9,159 | 454 | 64,362 |
| Guatay | 31 | 4,214 | 191 | 13,375 |
| Total | 127 | 24,877 | 882 | 129,534 |

## 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 Modified Route D Alternative through the La Posta, Campo, Dulzura, and Guatay Firesheds, 27% would present a very high conflict, 27% a high conflict, 36% a moderate conflict, and 9% a low conflict (Table E.4.15-8 and Figures E.4.15-14 through E.4.15-17). Two significant conflict areas are identified by the model, both located in the Campo Fireshed at MP MRD-10.5 to MRD-13 and MP MRD-15 to MRD-16.5.

Table E.4.15-8. Modified Route D Alternative Wildfire Containment Conflict Summary

| Fireshed | Low | Moderate | High | Very High |
|---|---|---|---|---|
| La Posta | 25% | 75% | 0 | 0 |
| Campo | 0 | 17% | 35% | 48% |
| Dulzura | 3% | 32% | 29% | 36% |
| Guatay | 34% | 33% | 11% | 22% |
| Route Summary | 9% | 36% | 27% | 27% |

Figure E.4.15-6. La Posta Fireshed Modified Route D Alternative Burn Probability Model
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Figure E.4.15-7. Campo Fireshed Modified Route D Alternative Burn Probability Model
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Figure E.4.15-8. Dulzura Fireshed Modified Route D Alternative Burn Probability Model
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Figure E.4.15-9. Guatay Fireshed Modified Route D Alternative Burn Probability Model
**CLICK HERE TO VIEW**

Figure E.4.15-10. La Posta Fireshed Modified Route D Alternative Fire Behavior Trend Model
**CLICK HERE TO VIEW**

Figure E.4.15-11. Campo Fireshed Modified Route D Alternative Fire Behavior Trend Model
**CLICK HERE TO VIEW**

Figure E.4.15-12. Dulzura Fireshed Modified Route D Alternative Fire Behavior Trend Model
**CLICK HERE TO VIEW**

Figure E.4.15-13. Guatay Fireshed Modified Route D Alternative Fire Behavior Trend Model
**CLICK HERE TO VIEW**

Figure E.4.15-14. La Posta Fireshed Modified Route D Alternative Wildfire Containment Conflict Model

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Figure E.4.15-15. Campo Fireshed Modified Route D Alternative Wildfire Containment Conflict Model

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Figure E.4.15-16. Dulzura Fireshed Modified Route D Alternative Wildfire Containment Conflict Model

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Figure E.4.15-17. Guatay Fireshed Modified Route D 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 Modified Route D 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 Modified Route D Alternative Substation, and many miles of new roads. 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-related ignitions within the Modified Route D corridor in the La Posta, Campo, Dulzura, and Guatay Firesheds 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 Modified Route D Alternative would include 39 miles of 500 kV overhead transmission line. The use of heavy equipment and the presence of personnel would increase the wildfire ignition potential in the project construction areas compared with existing conditions. For approximately 22 miles, the Modified Route D Alternative would be collocated with and in close proximity to an existing 69 kV line between MP MRD-9 and MRD-31.

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.

Wildfire history in the La Posta, Campo, Dulzura, and Guatay Firesheds shows an average number of large fires and major events over the last 50 years, and a high cumulative number of acres burned over the last 50 years. Due to the extensive WUI areas in the Campo, Dulzura, and Guatay Firesheds, a very large number of assets are at risk if a construction- or maintenance-related fire were to occur during both normal and extreme weather.

The combined Burn Probability Models for the Modified Route D Alternative indicate that a total of 28% of the border zone area has a high to very high probability of wildfire recurrence. The Fire Behavior Trend Model (Figures E.4.15-10 through E.4.15-13) indicates that a random fire ignition under normal weather conditions would burn outside of the border zone, spreading to the east into areas of dense vegetation in the Cleveland National forest and BLM lands, putting 127 homes and 24,877 acres at risk in two burn periods. The potential area burned during extreme fire weather conditions would be almost four times greater in the La Posta Fireshed, five times greater in the Campo Fireshed, seven times greater in the Dulzura Fireshed and three times greater in the Guatay Fireshed. During extreme weather conditions 882 homes and 129,534 acres at risk in two burn periods. Wildfire risk is extremely high throughout these firesheds where there is a substantial Intermix WUI with communities interspersed within CNF wildlands. The impact of project construction on the potential for a wildfire to have damaging consequences to communities, firefighter health and safety, and natural resources is considered significant, and it cannot be mitigated to a less than significant level (Class I).

This risk of ignition during normal and extreme weather and the risk of damage to structures can be reduced, although not to a less than significant level, 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 129,534 acres to approximately 24,887 acres) and the number of homes at risk (from more than 882 to approximately 127) along the alternative route. 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.

***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 La Posta Fireshed is a moderate risk fireshed due to the presence of patchy chaparral fuels. However, the Campo, Guatay, and Dulzura Firesheds are extremely high-risk firesheds based on wildfire history, fuels present, and assets at risk (see Fireshed Summary and Model Results, above), and any line faults that create sparks or ignite nearby vegetation could result in a large and catastrophic wildfire, putting 882 or more households and 129,534 or more acres at risk (see Fire Behavior Trend Model results, above) if transmission line ignitions were to occur during extreme weather conditions.

Wood poles currently support the existing 69 kV transmission line in the immediate vicinity of the Modified Route D Alternative transmission line route from MP MRD-9 to MRD-31. In Santa Ana wind conditions and in areas with wildland fuels, the alternative would create a hazard in combination with these wood poles because high winds could cause the poles to come into contact with the nearby conductors of the alternative. Wood poles have less structural integrity than steel poles, and a pole failure during an extreme Santa Ana wind event could come into contact with the adjacent conductor and start a wildfire with damaging impacts to communities, firefighters, and natural resources. The increased ignition risk associated with the presence of wood poles within 100 feet of the Modified Route D Alternative is considered a significant impact.

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 less than significant level, 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-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-2b Install existing conductors on steel poles.**

**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 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.4.15-14 through E.4.15-17) for the Modified Route D Alternative identifies two specific areas where the overhead transmission line would restrict wildfire containment to a very high degree. The conflict areas are located in the Campo Fireshed at MP MRD-10.5 to MRD-13 and MP MRD-15 to MRD-16.5 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 Modified Route D 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 cheat-grass, 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 Modified Route D Alternative 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. (See Appendix 12 for the full text of the mitigation measures.) 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 Modified Route D 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.4.15.3 Modified Route D Alternative Substation

The Modified Route D Alternative Substation would be a required component of the Modified Route D Alternative. It would be located at MP MRD-34 in the Guatay Fireshed (see Figure E.4.1-2). Impacts for this substation are included in the analysis of the Modified Route D Alternative, above.

## E.4.15.4 Star Valley Option

The Star Valley Option would include 2.6 miles of overhead and 0.4 miles of underground transmission line. It would replace the northern-most 2.2 miles of the Modified Route D Alternative, connecting the Modified Route D Alternative to the Interstate 8 Alternative between MP MRD-34 and MP I8-73.7.

Selection of this option would not change the severity of any of the impacts for the Modified Route D Alternative, above, because the Star Valley Option would only marginally change the level of construction or maintenance activities (Impact F-1) and the length of overhead transmission line (Impact F-2), and it 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).

## E.4.15.5 Future Transmission System Expansion

For the Proposed Project and route alternatives along the Proposed Project route, Section B.2.7 identifies Future Transmission System Expansion routes for both 230 kV and 500 kV future transmission lines. These routes are identified, and impacts are analyzed in Section D of this EIR/EIS, because SDG&E has indicated that transmission system expansion is foreseeable, possibly within the next 10 years. For the SWPL alternatives, 500 kV and 230 kV expansions would also be possible. The potential expansion routes for the Route D Alternative are described in the following paragraphs.

### 230 and 500 kV Future Transmission System Expansion

The Modified Route D Alternative would begin at approximately Interstate 8 MP-47 and would head southwest then northward until it reached the Interstate 8 Alternative at approximately MP I8-71. A substation could be built to convert the 500 kV line to 230 kV at approximately MD-34, the Modified Route D Substation Alternative. The double-circuit 230 kV line would exit the substation overhead, then continue north into the CNF, joining the Interstate 8 Alternative at approximately MP I8-71 where it transitions to underground at the east end of Alpine Boulevard. The Modified Route D Substation would accommodate up to six 230 kV circuits and a 500 kV circuit. Only two 230 kV circuits are proposed at this time, but construction of additional 230 kV circuits and a 500 kV circuit out of the Modified Route D Substation may be required in the future. There are three routes that are most likely for these future lines; each is described below. Figure E.1.1-6 illustrates the potential routes of the future transmission lines.

- Two 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. This route would follow the Interstate 8 Alternative route from the Interstate 8 Alternative Substation until MP I8-70.8 where it would transition underground until MP I8-79 where it would transition overhead again. The future transmission line route would continue to follow the Interstate 8 Alternative's overhead 230 kV route to the point where it meets the Proposed Project at MP 131. See Section E.1.15.1 and E.1.15.2 for the Fire and Fuels Management setting, impacts, and mitigation measures along the I-8 route. 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 Section D.15.2, for the Fire and Fuels Management setting, and see Section D.15.7 through D.15.11 for the impacts and mitigation measures for the Inland Valley, and Coastal Links of the Proposed Project. 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 shown in Figure B-12a. See Section D.15.13 for the Fire and Fuels Management setting, impacts, and mitigation measures for the Future Transmission System Expansion of the Proposed Project.
- Additional 230 and 500 kV circuits could follow the Route D Alternative corridor (see description in Section E.3.1) to the north of Descanso, after following the Interstate 8 Alternative 230 kV route from the Interstate 8 Substation to MP I8 70.3. See Section E.3.15.1 and E.3.15.2 for the Fire and Fuels Management setting, impacts, and mitigation measures along Route D. 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 northeastward 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). See Section D.15.2, for the Fire and Fuels Management setting, and see Section D.15.6 through D.15.11 for the impacts and mitigation measures for the Central, Inland Valley, and Coastal Links of the Proposed Project. See Section D.15.13 for the Fire and Fuels Management setting, impacts, and mitigation measures for the Future Transmission System Expansion of the Proposed Project.

- The future 230 and 500 kV lines could follow the Modified Route D Alternative corridor (within the 368 Corridor identified by the Department of Energy's Draft West-wide Corridor Programmatic EIS) south for 8 miles to MP MD-26. See Section E.4.15.1 and E.4.15.2 for the Fire and Fuels Management setting, impacts, and mitigation measures along Modified Route D. 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. See Section E.1.15.5 for the Fire and Fuels Management setting, impacts, and mitigation measures along MP MD-26 to MP I8-79 corridor. 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 (for a description of the Interstate 8 transmission corridor see Section E.1.1). 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 System (see description in Section B.2.7) from Chicarita to the Escondido Substation. See Section D.15.13 for the Fire and Fuels Management setting, impacts, and mitigation measures for the Future Transmission System Expansion of the Proposed Project.