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## Wildfire

This section evaluates the effects of proposed CalVTP implementation on wildfire and wildfire-related risks. The following analysis considers drivers of wildfire risk, and the how the proposed treatments could add to such risks or expose people or structures to wildfire risk. This section also provides background and context on wildfire concepts, such as wildfire regime and wildfire behavior, and wildfire management practices. Information used in this section was obtained from scientific journal articles, reports, and relevant fire and emergency-related plans.

Comments on the Notice of Preparation related to wildfire risk included concern that conditions are too erratic for prescribed burning to be safe and effective, recognition that wildfire ignitions are often human driven, recommendations to use the new 2019 CEQA Appendix G Checklist to address wildfire considerations, and a suggestion that the PEIR address location-specific conditions, particularly the potential for previous fires to limit the spread of subsequent wildfire (see Appendix A). Current conditions, treatment efficacy, and wildfire ignition sources are addressed in Section 3.17.1, “Environmental Setting.” The thresholds of significance used for the analysis of wildfire is provided in Section 3.17.3, “Impact Analysis and Mitigation Measures.”

### Environmental Setting

#### Wildfire Behavior and Controlling Factors

Wildfire behavior is a product of several variables, primarily weather, vegetation, topography, and human influences, which intermix to produce local and regional fire regimes that affect how, when, and where fires burn. The fire regime in any area is defined by several factors, including fire frequency, intensity, severity, and area burned. Each of these are important for an understanding of how the variables that affect fire behavior produce fire risks. Fire frequency refers to the number of fires that occur in a given area over a given period of time; fire intensity refers to the speed at which fire travels and the heat that it produces; fire severity involves the extent to which ecosystems and existing conditions are affected or changed by a fire; and area burned is the size of the area burned by wildfire.

##### Human Influence on Wildfire

Human influence on wildfire is broad and can be substantial. It includes direct influences such as the ignition and suppression of fires, and indirect influence through climate change and alterations in land use patterns that support modified vegetative regimes and increased development in the WUI (refer to “Climate Change and Wildfire” below for more discussion on the indirect effect of climate change on wildfire).

Anthropogenic influence more directly controls fire frequency (i.e., number of ignitions) than size of a burn because humans are responsible for most of the of ignitions. Once started, fires spread and behavior become a function of fuel characteristics, terrain, and weather conditions (Syphard et al. 2008). Human-induced wildfire ignitions can change fire regime characteristics in two ways: (1) changing the distribution and density of ignitions, and (2) changing the seasonality of burning activity (Balch et al. 2017). A study of wildfires across the U.S. for the 20-year period between 1992 and 2012 showed that 82 percent of wildfires during that period were started by human causes (Balch et al. 2017), while in California specifically, humans account for starting approximately 95 percent of wildfires (Syphard et al. 2007, Syphard and Keeley 2015). In California in 2016, more than half of all fires were caused by humans; including miscellaneous and undetermined causes, that number increases to 98 percent (CAL FIRE 2016).

Human ignitions include a multitude of sources, including escapes from debris and brush-clearing fires, electrical equipment malfunctions, campfire escapes, smoking, fire play (e.g., fireworks), vehicles, and arson. Consequently, areas near human development, especially in the WUI or in areas near campgrounds and roads, generate fires at a more frequent rate than very remote or urban areas (Syphard et al. 2007, Mann et al. 2016, Balch et al. 2017). Circumstances in California have made the environment particularly vulnerable to human-caused fires with expansion of the WUI and introduction of more people in areas susceptible to wildfire at all times of the year. A 2018 study indicates that the number of houses in the WUI increased nationwide by 41 percent between 1990 and 2010 (Radeloff et al. 2018).

##### Climate Change and Wildfire

As described in Chapter 1, “Introduction,” wildfires are a significant threat in California, particularly in recent years as the landscape responds to climate change and decades of fire suppression. It is estimated that since 1985, more than 50 percent of the increase in the area burned by wildfire in the western U.S. is attributable to anthropogenic climate change (Abatzoglou and Williams 2016). As climate change persists, it will produce increasing temperatures and drier conditions that will generate abundant dry fuels. All wildfires (those initiated by both natural and manmade sources) tend to be larger under drier atmospheric conditions and when fed by drier fuel sources (Balch et al. 2017).

Additionally, climate change has led to exacerbation of wildfire conditions during a longer period of the year as the spring season has warmed—driving an earlier spring snowmelt, and as winter precipitation has overall decreased (Westerling et al. 2006). Further, wildfire activity is closely related to temperature and drought conditions, and in recent decades, increasing drought frequency and warming temperatures have led to an increase in wildfire activity (Westerling et al 2006, Schoennagel et al. 2017). In particular, the western U.S., including California, has seen increases in wildfire activity in terms of area burned, number of large fires, and fire season length (Westerling et al. 2006, Abatzoglou and Williams 2016). These conditions have resulted in the largest, most destructive, and deadliest wildfires on record in California history, several of which occurred in 2018. The 2018 Camp Fire resulted in 85 known deaths, which is more than five times more deaths than the next largest and deadliest fire shown in Table 3.17-1 below (although the Camp Fire was the deadliest fire in recorded history, it is not reflected in Table 3.17-1 because it is not one of the top ten in terms of size). The 2018 Mendocino Complex, the state’s largest wildfire, burned 1.5 times as many acres as the next largest fire. Nine of the state’s 10 largest wildfires have occurred since 2003 (CAL FIRE 2019).

Table 3.17-1 Largest California Wildfires

| Fire Name (cause) | Acres | Date | County |
| --- | --- | --- | --- |
| Mendocino Complex (under investigation) | 459,123 | July 2018 | Colusa County, Lake County, Mendocino County & Glenn County |
| Thomas (powerlines) | 281,893 | December 2017 | Ventura & Santa Barbara |
| Cedar (human related) | 273,246 | October 2003 | San Diego |
| Rush (lightning) | 271,911 CA/43,666 NV | August 2012 | Lassen |
| Rim (human related) | 257,314 | August 2013 | Tuolumne |
| Zaca (human related) | 240,207 | July 2007 | Santa Barbara |
| Carr (human related) | 229,651 | July 2018 | Shasta County, Trinity County |
| Matilija (undetermined) | 220,000 | September 1932 | Ventura |
| Witch (powerlines) | 197,990 | October 2007 | San Diego |
| Klamath Theater Complex (lightning) | 192,038 | June 2008 | Siskiyou |

Source: CAL FIRE 2019

In addition to the size and destructiveness of the largest fires, the total number and total acreage of wildfires are also important. While the highly destructive fires attract the most attention in press coverage and public awareness, from the perspective of wildfire risk reduction, it is also critical to understand and address the more frequent and more widespread smaller fires. Total burned acreage in California can be highly variable, from fewer than 150,000 acres in 2010 to more than 1.6 million acres in 2018 (CAL FIRE 2018a, 2018b). Four in the last 12 years have exceed 1.0 million acres (2007, 2008, 2017, and 2018) (CAL FIRE 2018a, 2018b, 2018c). In 2018, there were over 7,500 wildfires in the state during the calendar year (CAL FIRE 2018b).

Climate change will continue to produce conditions that facilitate a longer fire season, which, when coupled with human-caused changes in the seasonality of ignition sources, will produce more, longer, and bigger fires during more times of the year. According to California’s Fourth Climate Change Assessment, *Statewide Summary Report* (2018), if GHG emissions continue to rise, the frequency of extreme wildfires burning over 25,000 acres could increase by 50 percent by 2100 and the average area burned statewide could increase by 77 percent by the end of the century (Bedsworth et al. 2018). Refer to Section 3.8, “Greenhouse Gas Emissions,” for additional discussion of climate change trends and the effects of climate change on the environment.

#### Wildfire Risk Reduction

Historically, humans have intervened deliberately and dramatically in the fire regime through fire suppression and, more recently, actions that affect fuel connectivity. Although an important practice in limiting fire spread, over time, the land management practice of fire suppression combined with forest regrowth after extensive logging in the late 19th century has led to a buildup of forest fuels and an increase in the occurrence and threat of large, severe fires (Westerling et al. 2006), although increased wildfire activity has also been found to be strongly associated with warming temperatures and earlier spring snowmelt (Westerling 2016). More extreme fire conditions can be expected in areas where the time between fires has been extended, unless fuels have been reduced by other means. Human development and suppression can postpone wildfires, but not exclude them, except in unusual circumstances (DOI and USDA 2014). With the expansion of the WUI and the threat that large, severe, intense wildfires pose, fire suppression remains one of the primary management techniques for more than 95 percent of wildfires in the U.S. (Schoennagel et al. 2017). Contemporary fire management practices include fuel management activities that are intended to reduce the intensity and severity of wildfires. Reduced intensity also means that suppression efforts are more likely to be effective and can be conducted more safely in areas where wildfires are unwanted or threaten communities (DOI and USDA 2014). Modern wildfire management practices may also encompass actions targeted at reducing human wildfire ignition through education programs.

Currently, there is much interest among researchers regarding fuel treatment effectiveness across the western U.S. Investigations, including model-based examinations, and associated publications addressing the effectiveness of fuel treatments and fire behavior are robust. However, there are some important data gaps in documenting fuel treatment effectiveness. In part, this is because the uncertainty of wildfire timing and location does not lend itself to a controlled experimental setting within which researchers could predict and measure pre-fire and post-fire conditions, and the available datasets and records of past fire and fuel treatments are not complete and comprehensive (Syphard et al. 2011, Barnett et al. 2016). Although more research to document certain aspects of fuel treatment effectiveness in the scientific literature is needed and ongoing as wildfires continue to increase in frequency, size, severity, and duration, there is consensus on the correlation between certain fuel treatments and wildfire risk; these are discussed in more detail in the subsections that follow.

##### Vegetation (Fuel) Management

Vegetation treatment is the primary approach to wildfire management, because it can reduce the intensity and severity of wildfire, slowing fire movement and creating favorable conditions for firefighting to protect targeted, high-value resources (Carey and Schuman 2003, Prichard et al. 2010). Fuel reduction has proven successful where it is targeted at protecting specific resources in limited geographic areas, such as in areas of extreme fire danger or in the WUI (Loudermilk et al. 2014). Areas that are treated often exhibit different fire progression characteristics and reduced fire severity from areas that are not treated (Lydersen et al. 2017, Johnson and Kennedy 2019). Reducing fuels through mechanical treatments and prescribed fire have been found to be effective at reducing fire frequency, fire severity, and annual area burned when applied at the landscape scale over an extended period of time (Kim et al. 2013, Martinson and Omi 2013, Prichard and Kennedy 2014, Tubbesing et al. 2019). These effects have also been found to be most effective during extreme weather conditions (i.e., hotter and drier). At these times, there is also a higher likelihood that fires will intersect with treated areas, which contributes to higher effectiveness of those treatments at reducing wildfire behavior and effects (Cassell 2018). Another study found simulated fuel treatments in the Lake Tahoe basin returned the forest to more historic and fire resilient conditions, reduced wildfire risk and severity, controlled wildfire carbon emissions, and in the long run, resulted in a net carbon gain (Loudermilk et al. 2014). In another study, mechanical treatments followed by prescribed burning produced the strongest results, with more resilient forest structures, lower surface fuel loads, and a reduced rate of accumulation of surface fuels (Schwilk et al. 2009).

It has also been found that fuel treatments are most effective when wildfires are driven by typical weather situations where prevailing seasonal conditions of temperature, soil/fuel, and moisture contents are present. In circumstances where extreme weather conditions exist, such as in cases of extremely low humidity and very high winds, fuel treatments are less effective (Brown et al. 2008), particularly when persistently high winds can blow hot embers over long distances. While evidence has not yet definitively concluded that forest fuel treatments lead to a reduction in the overall size of a fire (USFS 2009, Schoennagel et al. 2017), such treatments can aid in protecting public safety and homes and other structures by reducing wildfire intensity and severity in treated areas under normal fire conditions, and increasing firefighting effectiveness (Kalies and Yocom Kent 2016). Where treatments have occurred, the pattern of wildfire progression may be limited in some areas to low-intensity underbrush and surface burning, which can create safe conditions for firefighters to successfully suppress fires in areas near homes or other structures, or around areas of high resource value. Fuel treatments also promote faster forest recovery post-fire by causing less damage to soils and leaving some live vegetation within burn areas (USFS 2009), increasing seedling regeneration (Tubbesing et al. 2019), protecting resources such as soils, wildlife, riparian function, and wetlands (Kim et al. 2013), and reducing drought related tree mortality (Restaino et al. 2019).

One published literature review found that certain treatments, such as hand or mechanical thinning followed by prescribed fire, or prescribed fire alone, are very effective at reducing wildfire severity, and that related ecological impacts are often neutral to positive (Winford et al. 2015). Another published literature review indicates that fuel treatments reduce fire severity, crown and bole scorch, and tree mortality compared to untreated areas. This finding is most applicable to the combination of thinning (manual and mechanical treatments) and prescribed burn treatments. Increased treatment size and intensity (e.g., number of trees removed) can increase the effectiveness of the treatments. Firefighting effectiveness was also reportedly increased by treatments, due to increased visibility in treated areas, decreased heat and smoke of wildfire, increased penetration of retardant to surface fuels, safe access to the fire, and the ability to quickly suppress spot fires in treated areas (Kalies and Yocom Kent 2016).

##### Other Wildfire Risk Reduction Programs

Treatments to reduce hazardous vegetative fuels are occurring broadly within the treatable landscape, but at a limited pace and scale. As described in Chapter 1, “Introduction” and Section 2.3.1, “Past and Current Treatments,” vegetation treatment currently occurs around the state under several other wildfire risk reduction programs implemented by various federal, state, and local agencies. In 2017–2018, CAL FIRE treated approximately 33,000 acres in California using the same treatment activities as proposed under the CalVTP.

As described in Chapter 1, “Introduction,” wildfire prevention requires a complex and multifaceted approach. Wildfire prevention can generally be categorized as some combination of hazardous fuel reduction projects (the focus of the proposed CalVTP), fire prevention planning, and fire prevention education. Wildfire prevention programs and hazard reduction efforts by multiple participants, including private landowners, homeowners, non-governmental organizations, as well as local, state, and federal agencies are necessary and must work in concert to maximize effectiveness of all treatments and programs.

###### Strategies of the Forest Management Task Force

California’s Forest Management Task Force was created to protect the environmental quality, public health, and economic benefits that healthy forests provide to California. The Task Force aims to increase the rate of forest treatments and expand state wood product markets through innovation, assistance, and investment. Some of their management goals include expanding the use of prescribed fire across publicly and privately-owned lands and to increase public education and awareness of the importance of forest health and resiliency. Within the Task Force, there are seven subject matter working groups: forest management and restoration, regulations, prescribed fire, landowner education and outreach, wood utilization, tree mortality, and a science advisory panel. Each working group has identified management goals and meets regularly to identify action items, develop initiatives, and share knowledge on current and future efforts related to wildfire prevention (Forest Management Task Force 2019).

###### Community Wildfire Hazard Reduction Programs

Fire-adapted communities are communities located in a fire-prone area that require little assistance from firefighters during a wildfire. The general elements of a fire-adapted community include (University of Nevada 2010):

* Community protection: well-designed fuel breaks and safe areas.
* Defensible space: proper management of vegetation surrounding the home.
* Access: good access helps emergency responders arrive in a timely manner.
* Evacuation: prepared communities can evacuate safely and effectively.
* Built environment: appropriate home construction and maintenance resists ignitions.

Implementing community wildfire hazard reduction practices is an important component of establishing a fire-adapted community; key practices include establishing defensible space and implementing home hardening features. Homes have become one of the most combustible parts of the landscape and are increasingly vulnerable as development extends into the WUI; in certain cases, trees may survive a fire while a home may burn. California Public Resources Code (PRC) Section 4291, “Clearance Around Structures,” requires individual homeowners to clear and remove vegetation around homes and buildings. Compliance with PRC 4291 is required by any person who owns, leases, controls, operates or maintains a building or structure in or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands or any land that is covered with flammable material and is within the SRA. PRC 4291 requires 100 feet of Defensible Space (or to the property line if less than 100 feet) from every building or structure that is used for support or shelter of any use or occupancy. CAL FIRE has developed specific defensible space guidelines for homeowners per PRC 4291, to help individual homeowners implement defensible space, as well as implement home hardening techniques.

###### Wildfire Prevention Education

Wildfire prevention education has also been shown to be another effective form of wildfire risk reduction by successfully reducing the incidence of wildfire (Prestemon et al. 2010). Wildfire prevention education includes methods targeted at reducing accidental, preventable wildfire starts. Such prevention education might include public service announcements on radio or TV, visiting homeowners in at-risk areas, signs, news releases, presentations at public forums, or distributing handouts such as brochures and fliers. Other effective wildfire prevention programs can include enforcement of regulations prohibiting high-risk activities (e.g., fireworks). Wildfire prevention programs can be a cost-effective approach to reducing the incidence of wildfire because it reduces future firefighting costs, which can offset the initial costs associated with implementing these programs (Butry et al. 2010). Fire Safe Councils and their allies (RCDs, watershed groups, communities and residents) are leading the way in public outreach efforts and rely on peer-to-peer outreach and collaboration (Sonoma State University 2018).

###### Land Use Decision-Making

Another important consideration for wildfire risk reduction is land use decision-making in cities and counties. The authority to approve land uses rests with local government, rather than with the state. Risk of damage, injury, and loss of life can increase by placing structures and occupied land uses in harm’s way, when development is approved by cities or counties and implemented by property owners within fire hazard areas. While millions of California residents currently live in very high fire hazard zones, making development decisions to avoid increasing residential uses in these hazard zones has been an important and growing topic for California land use planning. One important tool will be mandated wildfire sections of local general plans. Currently, city and county general plans must include a Public Safety Element, and in the past, there have been no standards to which this element had to be prepared. Recent policy requires that Safety Elements of local general plans must be revised, upon the next update to the Housing Element, to address SRAs and very high fire hazard severity zones (VHFHSZs). The revisions must include information about wildfire hazards, as well as goals, policies, and feasible implementation measures for the protection of the community from the unreasonable risk of wildfire (OPR 2015). The Governor’s Office of Planning and Research has developed a technical advisory to help provide a robust fire hazard mitigation program to California communities, including a suite of voluntary recommendations and potential actions local governments can take to reduce community wildfire risk (OPR 2015). In addition, programs have been developed to help local governments reduce wildfire risks, associated costs, and create fire-adapted communities, such as Community Planning Assistance for Wildfire (CPAW). CPAW was developed in response to increasing wildfire risk nationwide and works to help communities become better fire-adapted through improved land use planning (Headwaters Economics 2019). Local land use planning and decision-making will continue to play an important role in community wildfire risk reduction and will need to work in tandem with state and federal efforts to most effectively reduce community wildfire risks.

#### wildfire regime

Three of the four variables controlling wildfire behavior described above (weather, vegetation, and human influence) are rapidly changing in California and elsewhere—changes which are producing a fire regime that is increasingly susceptible to fire danger and gradually becoming more hazardous. Warming, frequent droughts, and the legacy of past management policies, combined with the increase in development and expansion of the WUI, have increased the risk of catastrophic damage during wildfires, which poses a substantial threat and cost to society. Wildfires in California have, consequently, become of increasing concern for Californians, particularly for those who live in or near the WUI, where houses intermingle with natural areas, as they do in areas of the treatable landscape areas. Recent trends have shown an increase in the number of ignitions, area burned, and impacts to ecosystems since 2007. Annually, since 2000, the average annual acres burned in California has more than doubled the average of the 1960s (Board and CAL FIRE 2018). As previously discussed, wildfire frequency and severity in California are anticipated to increase over the next century.

As described in Section 2.4.1 of Chapter 2, “Program Description,” the treatable landscape has been divided into three broad categories (referred to as “fuel types”) that exhibit similar fire characteristics: tree, shrub, and grass. Refer to Section 2.4.1 for information related to fire spread and frequency for each fuel type. Within the primary fuel types, the tree fuel type occupies approximately 40 percent of the SRA and is the largest of the three groups. The grass and shrub fuel types occupy approximately 38 percent and 22 percent of the total acreage, respectively. The occurrence of fuel types in the SRA are shown in Figure 2-2.

#### Prescribed Burn Planning and Implementation

Prescribed burning is an existing tool for fire fuel management. Implementing a prescribed burn requires extensive planning, including the preparation of prescription burn plans, smoke management plans (SMPs), site-specific weather forecasting, public notifications, environmental considerations, and ultimately, favorable meteorological conditions which dictate whether a planned burn can move forward on a given day. These planning efforts are required of any agency planning a prescribed burn and are described in more detail below.

##### Planning a Prescribed Burn

This section describes the planning efforts required of any agency planning prescribed burning activities. Areas proposed for prescribed burning by an agency are typically identified at the beginning of each season. Prescribed burning often occurs in Spring and Fall, and occasionally in Winter, depending on weather conditions. Prior to prescribed burning, fire containment lines are typically established by clearing vegetation surrounding an area proposed for burning to help prevent the accidental escape of fire.

Many factors are considered when deciding to use prescribed burning in an area, including, but not limited to:

* landowner/agency goals for the property,
* topography,
* density of fuels,
* ecological goals,
* use for fuel break maintenance,
* strategic locations for protection of communities and/or forests,
* training goals for agency staff, and
* whether the burn can generally be completed within 1 day.

###### Burn Plan Prescription

Once areas suitable for prescribed burning are selected, prescriptions (e.g., wind direction, humidity, weather conditions) are developed in conjunction with modeling in a program such as BEHAVE to provide specific parameters for burning. The goal is to conduct understory burns which are safer and minimize long-term damage to vegetation. CAL FIRE and other agencies such as California State Parks typically prepare several areas for burning so that prescribed burning can occur as soon as the required conditions are met.

Specific treatment details are described in a prescription burn plan, which incorporates input from review agencies such as the California Department of Fish and Wildlife, local air pollution control districts, and regional water quality control boards, if necessary. Contents of a prescription burn plan also include the date, location, and description of the area in detail, prescriptive weather requirements, fire behavior modeling (e.g., BEHAVE), the ignition plan (including technique, time of day, and mop-up), a contingency plan, the SMP, public notification plan, a go/no go checklist, and contact information for the burn boss and others in charge of the prescription burn. Appendix PD-2 contains an example Burn Plan.

###### Smoke Management Plan

Smoke management planning is an integrated state and local effort. Prior to obtaining air district permission to burn, an agency must complete the following steps:

* register their burn with the appropriate air district,
* obtain air district burn permit,
* submit a SMP to the air district, and
* obtain air district approval of the SMP.

The SMP specifies the “smoke prescription,” which is a set of air quality, meteorological, and fuel conditions needed before burn ignition may be allowed. Depending on the size and complexity of the burn, the SMP will contain information such as nearby population centers, acceptable burn ignition conditions, contingency planning, burn monitoring procedures, smoke travel projections (including maps), smoke minimization techniques, and public notification procedures. Once the air district reviews and approves all of the burn requirements, including the burn permit and SMP, an agency may begin making the final preparations for the burn. This includes putting into place all of the resources needed to conduct the burn, notifying the public about the planned timing and specifics of the burn, and obtaining final air district authorization to burn. An agency may contact the air district up to 96 hours before the desired burn time to obtain California Air Resources Board (CARB) or air district forecasts of meteorology and air quality needed to safely conduct the burn. Agencies will continue to work with the air district and the CARB until the day of the burn to update the forecast information. Air district authorization to conduct a prescribed burn is provided to the agency preparing the prescribed burn no more than 24 hours prior to the burn. Appendix PD-2 contains an example SMP.

##### Prescribed Burn Implementation Procedures Specific to CAL FIRE

Although the following prescribed burning planning efforts are specific to CAL FIRE, each agency that plans and implements prescribed burns has its own set of agency-specific planning tools, planning and safety documents, public notification protocols, and best management practices to reduce risks related to safety, human health, and the environment.

###### Incident Action Plan

For every prescribed burn, CAL FIRE also requires the preparation of an Incident Action Plan (IAP) that includes communications and emergency protocols, standard best management practices, and emergency procedures. Specifically, an IAP includes the burn dates; burn hours; weather limitations; the specific burn prescription; a communications plan; a medical plan; a traffic plan; and special instructions such as minimizing smoke impacts to specific local roadways. An IAP also assigns responsibilities for coordination with the appropriate air district, such as conducting onsite briefings, posting notifications, weather monitoring during burning, and other burn related preparations. Development and implementation of the IAP establishes clear safety protocols and minimizes risk during prescribed burns.

###### Public Notification

Prior to implementing a prescribed burn, CAL FIRE also posts burn information such as burn location and the range of dates in which the burn will occur. This information is disseminated to potentially affected communities, typically in newspapers and on community bulletin boards. Sometimes press releases that include television and radio coverage are used, as well as social media platforms such as Twitter, to notify the public of upcoming prescribed burns. If planned burns are near public roads, signs are posted at both ends of the roadway segment where prescribed burning will occur.

##### Executing a Prescribed Burn

As described in Chapter 2, “Program Description,” the CAL FIRE staff required to execute a typical prescribed burn includes an Incident Commander and a large crew. Equipment onsite is determined by the Incident Commander on a case-by-case basis, but typically includes fire engines, large water storage containers, drip torches for ignition, and safety equipment deemed necessary by the Incident Commander (e.g., one Pulaski, which is a hand tool used in firefighting similar to an axe, per vehicle). One crew member is typically assigned to report weather to the Incident Commander every 30 minutes to make sure the burn is staying within its prescription. Also, a 10-hour fuel moisture stick is often used to monitor fuel moisture during a prescribed burn. If conditions ever deviate from the burn plan (also called “going out of prescription”) (e.g., winds change direction, humidity decreases), the burn is rescheduled, and crews transition from active burning activities to patrolling and/or extinguishing. In the event a prescribed burn goes beyond the perimeter of its planned area, the crew on-site works to control the escape. For larger escapes, helicopters and air tankers are on standby and may be called in to assist with regaining control.

Mopping up occurs after the prescribed burn and includes extinguishing any smoldering material along a fires’ edge, ensuring logs and debris cannot roll across the fire line, making sure all burning fuel is burnt out or is spread or buried to avoids sparks traveling, and clearing all sides of the fire containment line of snags, rotten logs, stumps, singed brush, and low hanging limbs of trees. Crews will monitor the area until the fire is completely out.

### Regulatory Setting

#### State

##### Board of Forestry and Fire Protection

The Board is a Governor-appointed body within CAL FIRE. It is responsible for developing the general forest policy of the state, determining the guidance policies of CAL FIRE, and representing the state’s interest in federal forestland in California. Together, the Board and CAL FIRE work to carry out the California Legislature’s mandate to protect and enhance the state’s unique forest and wildland resources.

The Board is charged with developing policy to protect all wildland forest resources in California that are not under federal jurisdiction. These resources include major commercial and non-commercial stands of timber, areas reserved for parks and recreation, woodlands, brush-range watersheds, and all private and state lands that contribute to California’s forest resource wealth. In addition, the Board is responsible for identifying VHFHSZ in the SRA and LRA. Local agencies are required to designate, by ordinance, VHFHSZ and to require landowners to reduce fire hazards adjacent to occupied buildings within these zones (Government Code Sections 51179 and 51182). The intent of identifying areas with very high fire hazards is to allow CAL FIRE and local agencies to develop and implement measures that would reduce the loss of life and property from uncontrolled wildfires (Government Code Section 51176). Fire hazard severity zones throughout the SRA are depicted in Figure 1-2 of Chapter 1, “Introduction.”

PRC Sections 4114 and 4130 authorize the Board to establish a fire plan, which, among other things, determines the levels of statewide fire protection services for SRA lands. The primary goals of the 2018 Strategic Fire Plan for California (Board and CAL FIRE 2018) include both suppression efforts and fire prevention efforts. Government Code Section 65302.5 gives the Board the regulatory authority to evaluate General Plan Safety Elements for their land use policies in the SRA and VHFHSZs, as well as methods and strategies for wildland fire risk reduction and prevention in those areas, which includes projects potentially covered by this PEIR.

###### 2018 Strategic Fire Plan for California

The *2018 Strategic Fire Plan for California* lays out central goals for reducing and preventing the impacts of fire in the state (Board and CAL FIRE 2018). This PEIR provides a framework for CAL FIRE to achieve the goals outlined in the *2018 Strategic Fire Plan* via implementation of a variety of vegetation treatment projects. The goals are meant to establish, through local, state, federal, and private partnerships, a natural environment that is more resilient and human-made assets that are more resistant to the occurrence and effects of wildland fire. The CalVTP is one such strategy that CAL FIRE and the Board employ to achieve those goals and vision. The goals of the *2018 Strategic Fire Plan* include the following:

* improve the availability and use of consistent, shared information on hazard and risk assessment;
* promote the role of local planning processes, including general plans, new development, and existing developments, and recognize individual landowner/homeowner responsibilities;
* foster a shared vision among communities and the multiple fire protection jurisdictions, including county-based plans and community-based plans such as Community Wildfire Protection Plans;
* increase awareness and actions to improve fire resistance of man-made assets at risk and fire resilience of wildland environments through natural resource management;
* integrate implementation of fire and vegetative fuels management practices consistent with the priorities of landowners or managers;
* determine and seek the needed level of resources for fire prevention, natural resource management, fire suppression, and related services; and
* implement needed assessments and actions for post-fire protection and recovery.

##### CAL FIRE

CAL FIRE is the California Department of Forestry and Fire Protection. It is dedicated to the fire protection and stewardship of over 31 million acres of the state’s privately-owned wildlands. In addition, CAL FIRE provides emergency services in 36 of the state’s 58 counties via contracts with local governments. PRC Section 4291 gives CAL FIRE the authority to enforce 100 feet of defensible space around all buildings and structures on non-federal SRA lands, or non-federal forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material. PRC Sections 4790 through 4799.04 provide the regulatory authority for CAL FIRE to administer the California Forest Improvement Program. PRC 4113 and 4125 give CAL FIRE the responsibility for preventing and extinguishing wildland fires in the SRA (PRC Sections 4113 and 4125). The PRC, beginning with Section 4427, includes fire safety statutes that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment with internal combustion engines; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided on site for various types of work in fire-prone areas. These requirements would apply to CalVTP treatment activities.

CAL FIRE currently implements vegetation treatments under PRC Sections 4475 through 4495. PRC Sections 4461 through 4471 and 4491 through 4494 authorize CAL FIRE to implement its existing Chaparral Management Program, now known, in part, as the Vegetation Management Program (VMP). In addition, with the 2005 passage of Senate Bill (SB) 1084, the Legislature modified, and in some cases, added language to PRC Sections 4475 through 4480 that:

* broadened CAL FIRE’s range of vegetation treatment practices beyond those described for the existing CMP and VMP,
* added a definition of “hazardous fuel reduction,” and
* made other changes to the major statutory provisions guiding CAL FIRE’s vegetation treatment authorities.

In addition to the *2018 Strategic Fire Plan for California,* individual CAL FIRE Units develop Fire Plans, which are major strategic documents that establish a set of tools for each CAL FIRE Unit to achieve in its local area. Updated yearly, Unit Fire Plans identify wildfire protection areas, initial attack success, assets and infrastructure at risk, pre-fire management strategies, and accountability within their Units’ geographical boundaries. The Unit Fire Plan identifies strategic areas for pre-fire planning and fuel treatment as defined by the people who live and work locally. The plans include contributions from local collaborators and stakeholders and are aligned with other plans for the area, such as Community Wildfire Protection Plans.

##### Executive Order B-52-18

On May 10, 2018, in response to the changing environmental conditions and the increased risk to California’s citizens, California Governor Brown issued Executive Order (EO) B-52-18 to support the state’s resilience to wildfire and other climate impacts, to address extensive tree mortality, increase forests’ capacity for carbon capture, and to improve forest and forest fire management. The Executive Order requires the California Natural Resources Agency, in coordination with the Board, CAL FIRE, and other agencies, to increase the pace and scale of fire fuel treatments on state and private lands. EO B-52-18 commits $96 million in additional state funds to for these efforts and calls for doubling the land actively managed through vegetation thinning, prescribed burning, and restoration from 250,000 to 500,000 acres per year to reduce wildfire risk.

##### Senate Bill 1260

On February 15, 2018, Governor Brown signed SB 1260, which aims to help protect California communities from catastrophic wildfire by improving forest management practices to reduce the risk of wildfires in light of the changing climate. It recognizes that prescribed burning is an important tool to help mitigate and prevent the impacts of the wildfire and includes provisions that encourage more frequent use of prescribed fire in managing California’s forest lands. SB 1260 also includes provisions for this PEIR to serve as the programmatic CEQA coverage for future prescribed burns within the SRA.

##### Senate Bill 901

Senate Bill 901 boosts government fire protection efforts by $1 billion over the next five years. CAL FIRE will oversee those funds, generally divided into two categories: $165 million per year for fire prevention grants to landowners and for community prevention efforts, and $35 million to continue CAL FIRE’s prescribed burning, research, and monitoring. Landowners will have new permission to help reduce overgrowth by cutting down small and mid-sized trees.

##### Emergency Response and Evacuation Plans

The State of California Emergency Plan was adopted on October 1, 2017 and describes how state government mobilizes and responds to emergencies and disasters in coordination with partners in all levels of government, the private sector, non-profits, and community-based organizations. The Plan also works in conjunction with the California Emergency Services Act and outlines a robust program of emergency preparedness, response, recovery, and mitigation for all hazards, both natural and human-caused. All local governments with a certified disaster council are required to develop their own emergency operations plan (EOP) for their jurisdiction that meet state and federal requirements. Local EOPs contain specific emergency planning considerations, such as evacuation and transportation, sheltering, hazard specific planning, regional planning, public-private partnerships, and recovery planning (Cal OES, 2017). Because the treatable landscape is located dispersed within the state, its spans the jurisdiction of several local and regional EOPs.

#### Local

When state agencies, including CAL FIRE, are conducting governmental activities under the authority of state law or the State Constitution, in this case, treatments proposed under the CalVTP, they are exempt from local government plans, policies, and ordinances (unless a constitutional provision or statute directs otherwise). Nonetheless, CAL FIRE voluntarily seeks to operate consistently with local governance to the extent feasible. Given its statewide extent and the possible number of local and regional responsible agencies, this PEIR does not identify potentially applicable local government plans, policies, and ordinances. Types of local regulations relevant to reducing wildfire risk may include city and county general plan policies, zoning ordinances, CAL FIRE Unit or Contract County Fire Plans (described below), and local EOPs. This PEIR assumes that any vegetation treatments proposed by local or regional agencies under the CalVTP would be consistent with local plans, policies, and ordinances, as required by SPR AD-3.

##### Contract County Fire Plans

In most cases, the SRA is protected directly by CAL FIRE; however, in Kern, Los Angeles, Marin, Orange, Santa Barbara and Ventura counties, SRA fire protection is provided by the counties under contract to CAL FIRE. Known as “Contract Counties,” they protect 3.4 million acres of SRA, most of which is in the treatable landscape. CAL FIRE provides funding to the six counties for fire protection services including wages of suppression crews, lookouts, maintenance of firefighting facilities, fire prevention assistants, pre-fire management positions, dispatch, special repairs, and administrative services. The funds also support infrastructure improvements and expanded firefighting needs when fires grow beyond initial attack. Similar to the Unit Fire Plans discussed above, Contract Counties develop and annually update their own Fire Plans to establish a set of tools for a Contract County to achieve in its local area.

### Impact Analysis and Mitigation Measures

#### Analysis Methodology

The analysis of environmental impacts on wildfire risk focuses on the potential for new or increased risks associated with wildfire, including impairment of an emergency response plan, exposing people or structures to uncontrolled fire, and post-fire risks such as slope instability or landslides. Significance determinations account for the influence of relevant SPRs, which are incorporated into treatment design and listed below.

* **SPR AD-3 Consistency with Local Plans, Policies, and Ordinances**: The project proponent will design and implement the treatment in a manner that is consistent with applicable local plans (e.g., general plans, Community Wildfire Protection Plans, CAL FIRE Unit Fire Plans), policies, and ordinances to the extent the project is subject to them. This SPR applies to all treatment activities and treatment types, including treatment maintenance.
* **SPR AQ-3 Create Burn Plan**: The project proponent will create a burn plan using the CAL FIRE burn plan template for all prescribed burns. The burn plan will include a fire behavior model output of First Order Fire Effects Model and BEHAVE or other fire behavior modeling simulation and that is performed by a qualified fire behavior technical specialist that predicts fire behavior, calculates consumption of fuels, tree mortality, predicted emissions, greenhouse gas emissions, and soil heating. The project proponent will minimize soil burn severity from broadcast burning to reduce the potential for runoff and soil erosion. The burn plan will be created with input from a qualified technician or certified State burn boss. This SPR applies only to prescribed burning treatment activities and all treatment types, including treatment maintenance.
* **SPR HAZ-2 Require Spark Arrestors**: The project proponent will require mechanized hand tools to have federal- or state-approved spark arrestors. This SPR applies only to manual treatment activities and all treatment types, including treatment maintenance.
* **SPR HAZ-3 Require Fire Extinguishers:** The project proponent will require tree cutting crews to carry one fire extinguisher per chainsaw. Each vehicle would be equipped with one long-handled shovel and one axe or Pulaski consistent with PRC Section 4428. This SPR applies only to manual treatment activities and all treatment types, including treatment maintenance.
* **SPR HAZ-4 Prohibit Smoking in Vegetated Areas:** The project proponent will require that smoking is only permitted in designated smoking areas barren or cleared to mineral soil at least 3 feet in diameter (PRC Section 4423.4). This SPR applies to all treatment activities and treatment types, including treatment maintenance.
* **SPR GEO-3 Stabilize Disturbed Soil Areas:** The project proponent will stabilize soil disturbed during mechanical, ~~and~~ prescribed herbivory treatments, and prescribed burns that result in exposure of bare soil over 50 percent or more of the treatment area with mulch or equivalent immediately after treatment activities, to the maximum extent practicable, to minimize the potential for substantial sediment discharge. If mechanical,  ~~or~~ prescribed herbivory, or prescribed burn treatment activities could result in substantial sediment discharge from soil disturbed by machinery, ~~or~~ animal hooves, or being bare, organic material from mastication or mulch will be incorporated onto at least 75 percent of the disturbed soil surface where the soil erosion hazard is moderate or high, and 50 percent of the disturbed soil surface where soil erosion hazard is low to help prevent erosion. Where slash mulch is used, it will be packed into the ground surface with heavy equipment so that it is sufficiently in contact with the soil surface. This SPR only applies to mechanical,  ~~and~~ prescribed herbivory, and prescribed burns that result in exposure of bare soil over 50 percent of the project area treatment activities and all treatment types, including treatment maintenance.
* **SPR GEO-4 Erosion Monitoring:** The project proponentwill inspect treatment areas for the proper implementation of erosion control SPRs and mitigations prior to the rainy season. If erosion control measures are not properly implemented, they will be remediated prior to the first rainfall event per SPR GEO-3 and GEO-8. Additionally, the project proponent will inspect for evidence of erosion after the first large storm or rainfall event (i.e., ≥ 1.5 inches in 24 hours) as soon as is feasible after the event. Any area of erosion that will result in substantial sediment discharge will be remediated within 48 hours per the methods stated in SPRs GEO-3 and GEO-8. This SPR applies only to mechanical, prescribed herbivory, and prescribed burning treatment activities and all treatment types, including treatment maintenance.
* **SPR GEO-5 Drain Stormwater via Water Breaks:** The project proponent will drain compacted and/or bare linear treatment areas capable of generating storm runoff via water breaks using the spacing and erosion control guidelines contained in Sections 914.6, 934.6, and 954.6(c) of the California Forest Practice Rules (February 2019 version). Where waterbreaks cannot effectively disperse surface runoff, including where waterbreaks cause surface run-off to be concentrated on downslopes, other erosion controls will be installed as needed to maintain site productivity by minimizing soil loss. ~~comply with 14 CCR 914 [934, 954].~~ This SPR applies only to mechanical, manual, and prescribed burn treatment activities and all treatment types, including treatment maintenance.
* **SPR GEO-8 Steep Slopes**: The project proponent will require a Registered Professional Forester (RPF) or licensed geologist to evaluate treatment areas with slopes greater than 50 percent for unstable areas (areas with potential for landslide) and unstable soils (soil with moderate to high erosion hazard). If unstable areas or soils are identified within the treatment area, are unavoidable, and will be potentially directly or indirectly affected by the treatment, a licensed geologist (P.G. or C.E.G.) will determine the potential for landslide, erosion, of other issue related to unstable soils and identity measures (e.g., those in SPR GEO-7) that will be implemented by the project proponent such that substantial erosion or loss of topsoil would not occur. This SPR applies only to mechanical treatment activities and WUI fuel reduction, non-shaded fuel breaks, and ecological restoration treatment types, including treatment maintenance.

#### Thresholds of Significance

Thresholds of significance are based on Appendix G of the State CEQA Guidelines. A treatment implemented under the proposed CalVTP would result in a significant impact related to wildfire if it would:

* impair an adopted emergency response plan or emergency evacuation plan;
* due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
* require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or
* expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

#### Issues Not Evaluated Further

The proposed CalVTP would be implemented on approximately 250,000 acres annually within the treatable landscape to reduce the size, number, and frequency of damaging fires and reduce losses to life, property, and natural resources. One of the treatment types proposed includes the installation of fuel breaks within strategically located areas to support fire-control activities. Because the CalVTP includes the installation of fuel breaks, the associated potential temporary and ongoing impacts to the environment are evaluated throughout Chapter 3 of this PEIR. No other infrastructure (such as roads, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment are proposed under the CalVTP. Therefore, this issue is not discussed further.

As discussed in Section 3.10, “Hazardous Materials, Public Health, and Safety,” and Section 3.15, “Transportation,” implementation of the CalVTP would not alter potential emergency evacuation routes or impair an adopted emergency plan. This issue is not discussed further.

The proposed CalVTP does not include any new housing or other land uses where the public would congregate; there would be no new project occupants that could be exposed to pollutant concentrations from a wildfire or the uncontrolled spread of as wildfire as a result of the CalVTP. However, there is a risk of exposing existing receptors to smoke from prescribed burning, including when the prescribe been deviates from the prescription; this is addressed in Impact AQ-1 and Impact AQ-4 in Section 3.4, “Air Quality.” The potential to expose people to the uncontrolled spread of wildfire by exacerbating wildfire risks while implementing the CalVTP is addressed in Impact WIL-1 below.

#### Impact Analysis

Impact WIL-1: Substantially Exacerbate Fire Risk and Expose People to Uncontrolled Spread of a Wildfire

Vegetation treatment activities under the CalVTP could result in temporary risks associated with uncontrolled fire from prescribed burning, as well as from the use of vehicles and heavy machinery in the treatable landscape as each can increase the risk of an accidental wildfire ignition. However, several SPRs would be implemented to reduce the risk of uncontrolled spread of fire from treatment activities. Machine-powered hand tools would have federal- or state-approved spark arrestors (SPR HAZ-2); vegetation treatment crews would carry one fire extinguisher per chainsaw and one long-handle shovel and one axe or pulaski (SPR HAZ-3); and smoking would only be permitted in designated smoking areas with barren or cleared mineral soil to at least 3 feet in diameter (SPR HAZ-4). In addition, given the extensive preparation and planning prior to a prescribed burn (e.g., preparation of a SMP and Burn Plan), active monitoring and maintenance during a prescribed burn, and implementation of stringent safety protocols, prescription burning would not substantially exacerbate fire risk that could result in the uncontrolled spread of wildfire. Furthermore, one of the main objectives of the proposed CalVTP is reduce the frequency and severity of future uncontrolled wildfire. This impact would be **less than significant**.

Vegetation treatment activities could result in temporary risks associated with uncontrolled fire from prescribed burning, as well as from the use of vehicles and heavy machinery in the treatable landscape as each can increase the risk of an accidental wildfire ignition. As summarized in Chapter 2, “Program Description,” several SPRs would be implemented to reduce the risk of uncontrolled spread of a wildfire from treatment activities. Machine-powered hand tools would have federal- or state-approved spark arrestors (SPR HAZ-2), which prevent the emissions of flammable debris. Vegetation treatment crews would carry one fire extinguisher per chainsaw and one long-handle shovel and one axe or pulaski (SPR HAZ-3), to quickly respond to an ignition should one occur. Additionally, smoking would only be permitted in designated smoking areas with barren or cleared mineral soil to at least 3 feet in diameter (SPR HAZ-4), which would help to minimize the risk of accidental wildfire ignition. Therefore, it’s unlikely that the presence and use of vehicles and equipment needed to implement the treatment activities would substantially exacerbate fire risk resulting in the uncontrolled spread of wildfire.

As discussed in Section 3.17.1 under “Prescribed Burn Planning and Implementation,” implementing a prescribed burn requires extensive planning, including the preparation of prescription burn plans, SMPs, site-specific weather forecasting, public notifications, safety considerations, and ultimately favorable weather conditions so a burn can occur on a given day. Prior to implementing a prescribed burn, fire containment lines are established by clearing vegetation surrounding the designated burn area to help prevent the accidental escape of fire. During a prescribed burn, fire engines, large water storage containers, and safety equipment deemed necessary by the Incident Commander (e.g., one Pulaski per vehicle) are on-site. One crew member is assigned to report weather to the Incident Commander every 30 minutes to make sure the burn is staying within its prescription. If conditions ever deviate from the burn plan (also called “going out of prescription”), the burn is rescheduled, and crews transition from active burning activities to patrolling and extinguishing. In the event a prescribed burn goes beyond the perimeter of its planned area, hand crews and fire engines are on-site to control the escape. In the event of a large escape (which is rare), helicopters and air tankers are on standby and may be called in to assist with regaining control and other CAL FIRE firefighting resources can be mobilized. Therefore, given the extensive planning and preparation before a prescribed burn, active monitoring and maintenance during a burn, and implementation of safety protocols, prescription burning would not substantially exacerbate fire risk or result in the uncontrolled spread of wildfire.

In the long term, as one of the primary purposes of the program, implementation of the treatment activities under the CalVTP would reduce wildfire risk. Fuel reduction activities in the WUI would consist of strategic removal of vegetation to prevent or slow the spread of wildfire between structures and wildlands and vice versa. Fuel breaks would create zones of vegetation removal and ongoing maintenance, to help passively interrupt the path of a fire or slow its progress and to support fire suppression by providing responders with a staging area and access to remote locations for fire control actions. Ecological restoration would focus on restoring ecosystem processes, conditions, and resiliency by modifying uncharacteristic wildland fuel conditions to reflect historic vegetative composition, structure, and habitat values. Therefore, to the extent the treatments reduce wildfire risk, implementation of the CalVTP would have a beneficial impact related to wildfire over the long-term and would not exacerbate fire risk. This impact would be **less than significant**.

##### Mitigation Measures

No mitigation is required for this impact.

Impact WIL-2: Expose People or Structures to Substantial Risks Related to Post-Fire Flooding or Landslides

The proposed CalVTP does not include new housing nor would it result in substantial unplanned population growth. Therefore, it would not place people or structures in an area with risks related to post-wildfire flooding or landslides. Prescribed burning implemented under the proposed CalVTP would be low severity and typically retain substantial vegetation, thereby maintaining stability of the soil. In addition, SPRs GEO-3, GEO-4, GEO-5, GEO-8, and SPR AQ-3 would be incorporated into qualifying projects under the CalVTP to stabilize disturbed soils from treatments to minimize erosion (SPR GEO-3), inspect treatment areas for evidence of erosion after prior to the rainy season and following the first large rainfall event (SPR GEO-4), drain stormwater via water breaks to reduce stormwater runoff (SPR GEO-5), minimize soil burn severity during prescribed burns which would help to retain vegetation to stabilize the soil (SPR AQ-3), and require that a registered professional forester or licensed geologist evaluate treatment areas for potential issues with instability and modify treatments to account for instability issues (SPR GEO-8). Therefore, prescribed burning under the CalVTP would not expose people or structures to substantial risks from post-prescribed burning landslides or flooding. Furthermore, one of the primary purposes of the CalVTP is to reduce the frequency and severity of wildfire. Therefore, the intended wildfire risk reduction achieved with implementation of the CalVTP could also result in a reduction in the associated post-wildfire risk of landslides and flooding. The impact would be **less than significant.**

As described in Chapter 3.12, “Land Use and Planning, Population and Housing,” Impact LU-2, the CalVTP does not include new housing nor would it result in substantial unplanned population growth. Therefore, it would not place people or structures in areas with risks related to post-wildfire flooding or landslides.

As described in Section 3.7, “Geology, Soils, Paleontology, and Mineral Resources,” Impact GEO-2, moderate to high severity wildfire can greatly increase the likelihood of debris sliding and debris flows as well as loss of soil hydrologic function by sealing pores and degradation of soil structure and productivity. As a result, subsequent rainstorms after wildfire can produce flash floods and debris flows, which can impact people or structures these are located below an area that has burned. However, fires that burn with low severity maintain soil cover, mineralize important nutrients from plant matter stored on the soil surface, reduce fuel loads that could possibly otherwise lead to future high-severity burns, and stimulate the growth of herbaceous vegetation, which helps to facilitate nutrient cycling.

Prescribed burning under the CalVTP would be low severity and typically retain approximately 70 percent of vegetation, including root systems. Therefore, areas would remain stable post prescribed burning, and no major changes to drainage or runoff would be expected. In addition, SPRs GEO-3, GEO-4, GEO-5, GEO-8, and SPR AQ-3 would be incorporated into qualifying projects under the CalVTP projects to stabilize disturbed soil areas from treatments to minimize erosion (SPR GEO-3), inspect treatment areas for evidence of erosion before the rainy season and following the first large rainfall event (SPR GEO-4), drain stormwater via water breaks to reduce stormwater runoff (SPR GEO-5), minimize soil burn severity during prescribed burns which would help to retain vegetation to stabilize the soil (SPR AQ-3), and require that a registered professional forester or licensed geologist evaluate treatment areas for potential issues with instability and modify treatments to account for instability issues (SPR GEO-8). Therefore, prescribed burning under the CalVTP would not expose people or structures to substantial risks from post-prescribed burning landslides or flooding. Furthermore, to the extent the treatments reduce wildfire risk, they would decrease the risk of landslides and flooding in areas that could otherwise burn in a high severity wildfire without treatment.

With the implementation of SPRs, people and structures would not be exposed to substantial risks from post-fire landslides or flooding with the implementation of the CalVTP, and the impact would be **less than significant**.

##### Mitigation Measures

No mitigation is required for this impact.

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