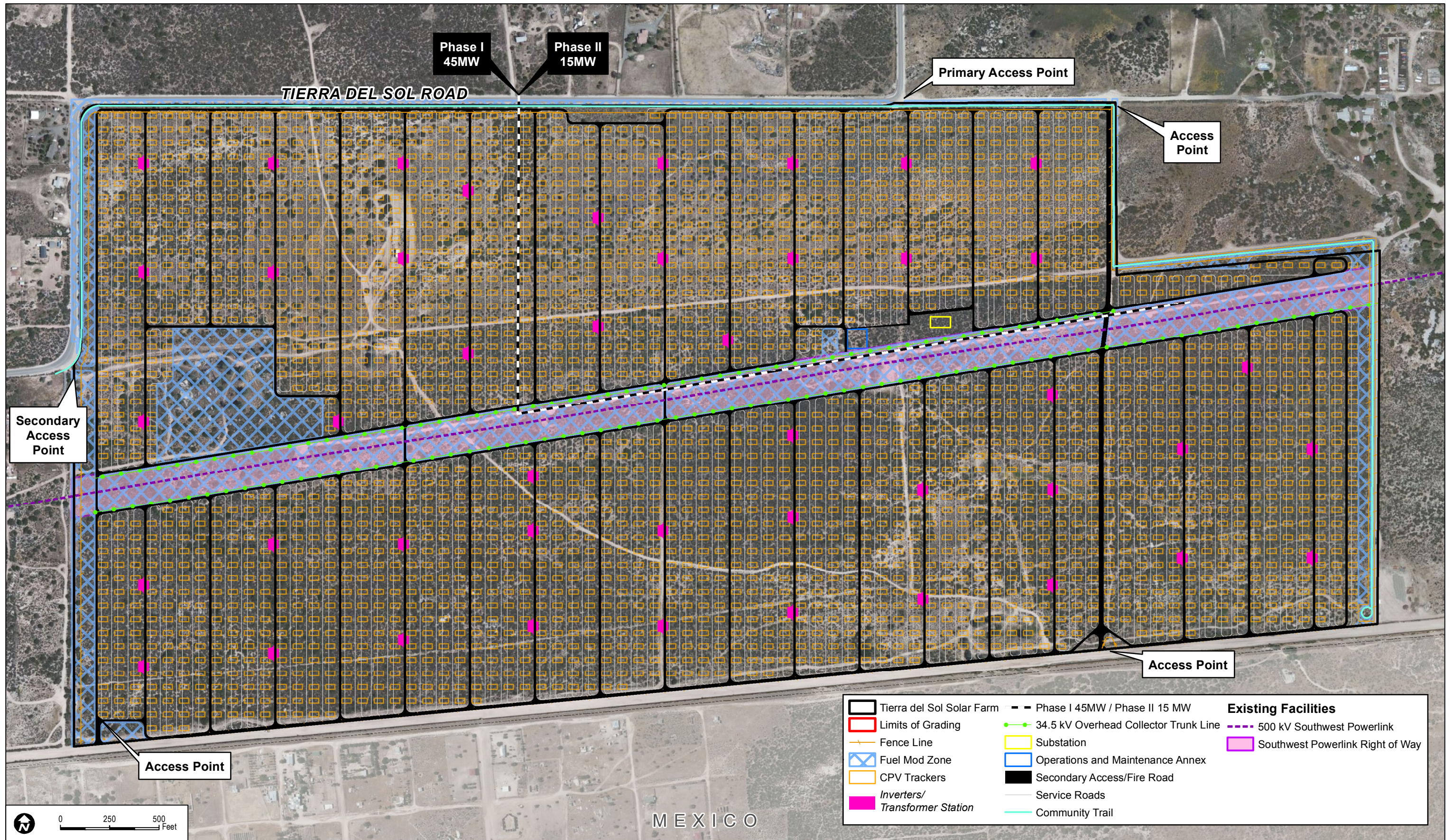




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Tierra del Sol Solar Farm Project Fire Protection Plan

Tierra del Sol Solar Farm construction would consist of several phases including site preparation, development of staging areas and site access roads, tracker assembly and installation, and construction of electrical transmission facilities. The project would require a total of approximately 372 acres of site preparation activities prior to solar CPV installation, in addition to approximately 47 acres of fire buffer preparation involving non-motorized brush clearing techniques. After site preparation, initial project construction would include the development of the staging and assembly areas. The solar farm would be constructed over a period of up to approximately 14 months, which includes Phase I, Phase II, and the gen-tie line.

1.1.3 Construction Fire Prevention

This FPP is applicable to the ongoing operation and maintenance of the Project. This FPP is not intended to apply to the construction phases of the Project. A separate “Construction Fire Prevention Plan” document shall be prepared, reviewed and approved by SDCFA and CAL FIRE a minimum of 45 days prior to construction activities associated with this Project. The document will address fire prevention measures that will be employed during the construction phase, identifying potential sources of ignition and detailing the measures, equipment, and training that will be provided to all site contractors. Example Construction Fire Prevention Plans are available for previously entitled San Diego County energy projects and they can be easily adapted for this project.

1.1.4 Environmental Setting

Dudek conducted a site evaluation on January 18, 2012. Appendix B provides photographs of the site and adjacent landscapes. The site inspection included an evaluation of vegetation/fuels, topography, and existing infrastructure and documented existing off-site conditions, including adjacent fuel types, topographic conditions, and surrounding land use types. The site evaluation was also used to confirm necessary fire behavior modeling input data.

1.1.4.1 Topography

Located in east county of San Diego, the Tierra del Sol Solar Farm site and the gen-tie transmission lines straddle the Tecate Divide, between the Laguna Mountains above and the desert below. The topography of the solar farm site is generally east-southeasterly sloping. Site elevations range from approximately 3,720 feet above mean sea level (msl) in the highest portions to the west to 3,580 feet msl in the southeast. The project site drains to the east and west via naturally eroded drainages from a gently sloping ridge which trends approximately north-south on the western portion of the site. The project site is generally flat

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with only 0.11 acres (.13%) have slopes between 25% and a maximum slope of 50% or greater. The areas with slopes greater than 25% are located primarily in the northwest and northeast corner of the site.

Post project, the site's topography will be altered such that land beneath and adjacent to the individual trackers and other site structures will be flat. There will still be changes in elevation across the site, but they will be less abrupt than currently and with a graded surface

The gen-tie line extends from the Tierra del Sol site north/northeast toward the Boulevard substation. It crosses slightly rolling terrain of the Tecate Divide. Elevations along the transmission line range from 3400 feet msl near Boulevard to about 3800 feet msl at the solar farm project site and Rattlesnake Mountain.

1.1.4.2 Vegetation

Based on Dudek's site visit and substantiated by the project's Biological Technical Report, (Dudek 2012), there are 13 vegetation communities/land cover types on site, including big sagebrush scrub, granitic chamise chaparral, granitic northern mixed chaparral, disturbed land, flat-topped buckwheat, coast live oak woodland, open water, and red shank chaparral. The acreage of each of these vegetation communities/land cover types are provided in Table 1 and their distribution on the site is illustrated in Appendix C. As indicated, granitic chamise, granitic northern mixed and red-shank chaparral communities dominate much of the project site and the dominance of chaparral corresponds with dominant vegetation off-the site, which represents the fuels that would spread wildfire toward or away from the Project.

Table 1
Tierra Del Sol Solar Farm Project Vegetation Communities

Vegetation Community/Land Cover	Acres	Percentage Cover
Big Sagebrush Scrub	16.2	3.8%
Granitic Chamise Chaparral	177.0	42.1%
Granitic Chamise Chaparral/Flat-topped Buckwheat	2.2	0.5%
Granitic Northern Mixed Chaparral	68.2	16.2%
Granitic Northern Mixed Chaparral/Flat-topped Buckwheat	13.3	3.1%
Disturbed Land	21.9	5.2%
Flat-topped Buckwheat	41.0	9.7%
Disturbed Flat-topped Buckwheat	2.3	0.54%
Flat-topped Buckwheat/Red Shank Chaparral	2.0	0.4%
Coast Live Oak Woodland	0.9	0.2%
Open Water	0.1	0.0%

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Table 1
Tierra Del Sol Solar Farm Project Vegetation Communities

Vegetation Community/Land Cover	Acres	Percentage Cover
Red Shank Chaparral	68.5	15.4%
Scrub Oak Chaparral	6.03	1.4%
Total	419.6	100.0%

In addition to the solar site, the Gen-Tie interconnect traverses several vegetation types, including Granitic Northern Mixed Chaparral, Red Shank chaparral, annual grass pastures, oak woodlands, S, and disturbed land. Descriptions of these vegetation types follows.

Disturbed Land - Disturbed land refers to areas that have been permanently altered by previous human activity that has eliminated the native groundcover. Disturbed land on site consists primarily of unpaved roads as well as exotic trees that were intentionally planted around historical development pads (i.e. Tecate cypress and pine (*Pinus* sp.)). These roads and historical development pads/wind row areas have been graded and contain little native vegetation.

Flat-topped Buckwheat - Flat-topped buckwheat often forms a nearly monotypic stand that results from disturbance. It is often transitional to coastal sage scrub or chaparral and intergrades with Diegan coastal sage scrub. Characteristic species include California buckwheat (*Eriogonum fasciculatum*) and deerweed (*Acmispon glaber*) (Oberbauer et al. 2008). On site, areas mapped as flat-topped buckwheat are dominated by Eastern Mojave buckwheat, but also include species such as chamise and deerweed. This community occurs in patches throughout the site Appendix C.

Big sagebrush scrub – Big sagebrush scrub is characterized as being a moderately open shrubland consisting predominantly (greater than 50% absolute cover) of big sagebrush (*Artemisia tridentata* ssp. *tridentata*). It often occurs in or adjacent to the floodplain in the sandy transition to chaparral. This community occurs in the northeastern portion of the site (Appendix C).

Granitic Northern Mixed Chaparral - Northern mixed chaparral consists of broad-leaved sclerophyll shrubs, that range from 2–4 meters (7–13 feet) in height that forms dense stands dominated by Nuttall's scrub oak (*Quercus dumosa*), chamise, manzanita (*Arctostaphylos* spp.), and ceanothus (*Ceanothus* spp.). This community occurs is indicated by desert ceanothus (*Ceanothus greggii*) and other codominants (chamise, scrub oak (*Quercus berberidifolia*), and other oak hybrids). Granitic northern mixed chaparral is underlain by granitic soils. On site, northern mixed chaparral includes chamise, interior live oak (*Quercus wislizeni*), redshank (*Adenostoma sparsifolium*), California buckwheat, and deerweed. There

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are 2.0 acres of disturbed northern mixed chaparral in the northwestern portion of the site that have been graded in the past; currently vegetation is at low cover and regrowing (Appendix C).

Granitic Chamise Chaparral – Granitic chamise chaparral contains shrubs, overwhelmingly dominated by chamise, from 3–10 feet tall with little cover provided by other species. Stump sprouting allows this vegetation to adapt to repeated fires. Granitic chamise chaparral typically occurs on dry slopes and ridges (Holland 1986). The granitic chamise chaparral on site consists predominantly of chamise, but also includes California buckwheat, threadleaf snakeweed, California jointfir (*Ephedra californica*), hairy yerba santa (*Eriodictyon trichocalyx*), sugar sumac, deerweed, and narrowleaf goldenbush (*Ericameria linearifolia*). Granitic chamise chaparral occurs throughout much of the project site (Appendix C).

Red Shank Chaparral - Red shank chaparral is comprised of nearly pure stands of red shank (*Adenostoma sparsifolium*) (Holland 1986). It is similar to granitic chamise chaparral but is typically taller and somewhat more open (Holland 1986). In red shank chaparral communities on site, red shank is dominant or codominant with chamise. Other shrub species include Eastern Mojave buckwheat, California cholla (*Cylindropuntia californica*), and chaparral yucca (*Hesperoyucca whipplei*). Red shank chaparral occurs in various locations throughout the site, predominantly in the southwestern portion (Appendix C).

Coast Live Oak Woodland- Coast live oak woodland is dominated by a single evergreen species: coast live oak (*Quercus agrifolia*) with a canopy height reaching 40 feet (Holland 1986). On site, the shrub layer includes chamise, California buckwheat, and California cholla and chaparral yucca.

The Project will include removal of most of the vegetation from the site and replacement with fuel modification areas comprised of consistent low growing, low fuel accumulation species. The Gen Tie alignment will not include removal of vegetation, except as necessary for installation and maintenance according to applicable vegetation management standards.

1.1.4.3 Fuel Loads

The vegetation described above translates to fuel models used for fire behavior modeling, discussed in detail in Chapter 3 of this FPP. Variations in vegetative cover type and species composition have a direct effect on fire behavior. Some plant communities and their associated plant species have increased flammability based on plant physiology (resin content), biological function (flowering, retention of dead plant material), physical structure (leaf size, branching patterns), and overall fuel loading. For example, the native shrub

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species that compose the chaparral and coastal sage–chaparral scrub plant communities on site are considered to exhibit higher potential hazard based on such criteria.

Vegetation distribution is extremely consistent on and adjacent this site and is dominated by mixed and granitic chaparral. The importance of vegetative cover on fire suppression efforts is its role in affecting fire behavior. For example, while fires burning in chaparral fuel types may exhibit higher flame lengths than those burning grasslands, fire spread rates in grasslands are much more rapid than those in other chaparral fuel types. Fuel loads for the chaparral vegetation dominating the site is estimated to be 14.4 tons/acre. Other on-site fuels, including buckwheat and sagebrush vegetation types, have lower fuel loads, typically ranging from 4.0 to 9.7 tons/acre. Off-site, adjacent fuels vary from disturbed in patches to the north, south, east and west as well as unbroken fuel beds in all directions that would represent the closest fuel sources once the site has been graded and the Project has been constructed.

1.1.4.4 Fire History

Regional fire history is an important component of a site-specific FPP. Fire history information can provide an understanding of fire frequency, fire type, most vulnerable project areas, and significant ignition sources, amongst others. Appendix D presents fire history for the Project vicinity. As presented, there have been several recorded wildfires in the vicinity of the project area (solar farm and gen-tie transmission line) Fire history data was obtained from Cal Fire's Fire and Resource Assessment Program¹ database. The majority of the Project's vicinity has experienced fewer than four recorded fires. However, an area located north and east of Tecate, Mexico has experienced several fires that have burned into the United States. This area is roughly 8 miles west of the project site. The fires recorded from this area that burned into the U.S. likely occurred prior to construction of the border fence.

The most recent fire that burned through the solar farm project site was the 2012 Shockey Fire which consumed 2,556 acres. Per conversation with local firefighters, the Shockey Fire burned through heavy fuels consisting of red shank with 60 feet high flame lengths under a typical fall weather condition (12-20 mph winds). Prior to the Shockey Fire, three wildland fires (2010 Border 10, 1993 Outside Origin #2, and 1953 Hi Pass), burned within .1 mile of the solar farm site, but touched along northern and southern portions of the Gen-Tie Line. A list of additional fires that have burned within a 3-mile radius of the proposed Project is

¹ Cal Fire – Fire and Resource Assessment Program (<http://frap.cdf.ca.gov/>).

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provided in Appendix D. Based on a review of this information, fire return intervals in the greater region have occurred on average about every 7 years.

1.1.4.5 Climate

The Project is located in an area with seasonal fluctuations in temperatures and rainfall. During the wet winter months, the average daily high temperature in Boulevard is approximately 62.7° Fahrenheit (F) and the average daily low temperature is approximately 33.4°F. Average precipitation during this period ranges from 2.06 to 2.99 inches per month, with an average rainfall of 2.6 inches. During the dry summer months, the average daily high temperature is approximately 91°F and the average daily low temperature is approximately 50°F. Average precipitation during this period ranges from 0.06 to 0.33 inch, with an average of 0.30 inch per month (Ramona Fire Station Weather Data 2008). Average annual rainfall accumulation (October 1–September 30) is 14.78 inches per year (Campo Fire Station Weather Data 2012).

The climate in the project area is typified by hot, dry summers and wet winters. Precipitation typically occurs between December and March. The prevailing wind is an onshore flow with fall winds (Santa Ana Winds) from the northeast that may gust to 50 miles per hour (mph) or higher. The project area's climate, as with that of Southern California, has a large influence on the fire risk as drying vegetation (fuel moisture for 1-hour fuels of less than 5% is possible) during the summer months becomes fuel available to advancing flames should an ignition be realized. Extreme conditions, used in fire modeling for this site, include 95°F temperatures in summer and wind gusts of 50 mph during the fall. Relative humidity of less than 10% is possible during fire season.

1.1.4.6 Current Land Use

The Project is located nearest the unincorporated community of Tierra Del Sol, approximately 50 miles southeast of downtown San Diego, 15 miles west of the San Diego/Imperial County line, 5 miles south of Interstate 8, and directly bordering the U.S./Mexico international border. Existing land uses in the study area consist of relatively large-lot modest rural residences and ranches interspersed with undeveloped, chaparral and boulder strewn lands. Public agency lands are also prevalent in the area as are tribal lands (for example, the Campo Indian Reservation is located approximately 1 miles west of the proposed project site). Overall, development in the area is somewhat sparse due to the topography and density of local vegetation as well due to the remote location of the area. The local landscape is a mixture of large-lot rural residences, dirt access roads and undeveloped natural areas with dense vegetation, rolling to moderately steep terrain and rock

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outcroppings. While relatively low, rocky ridgelines are visible in the immediate area, the prominent ridgeline of distant mountainous terrain is located to the north, east, and south. The site is traversed by the 500 kV Southwest Power Link, which consists of lattice steel towers. The site is gently rolling. It has been previously disturbed for agricultural purposes and is zoned agricultural.

The U.S. Mexico border fence is a prominent feature on the landscape and is highly visible from adjacent portions of the project site (the site adjoins the 50 foot wide Federal Reserve line that runs north from the border fence) The parcels comprising the Project are undeveloped but include small structures near the western portion and middle of the study area. The entire study area is fenced, including the US/Mexico border fence along the southern portion of the study area. The area is accessed through locked gates and dirt roads that traverse the study area.

1.1.4.7 Proposed Land Use

The Project would include removal of existing vegetation and structures from the project site, grading to create flat pad areas, construction of solar facilities and an approximately 6-mile long gen-tie line. The Project is planned to provide approximately 45 MW's of concentrating photovoltaic ("CPV") generation to be constructed on the 420 acre site. The Project land use would include solar arrays, access roads, water tanks, overhead and underground electrical transmission lines, a perimeter chain link fence, and related infrastructure for a solar farm, as described herein.

San Diego Gas and Electric (SDG&E) is currently processing a permit with the California Public Utilities Commission (CPUC) to construct a rebuilt substation adjacent to the existing Boulevard Substation that would provide 138 kV and 69 kV facilities to accommodate renewable energy interconnections and continue providing 12 kV facilities to service the surrounding area. As proposed, the Tierra del Sol Solar Farm Project site would connect to the rebuilt SDG & E Boulevard Substation from a 138 kV gen-tie transmission line

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Fire Protection Plan

2.0 DETERMINATION OF PROJECT EFFECTS

FPPs provide an evaluation of the adverse environmental effects a proposed project may have from wildland fire. The FPP must provide mitigation for identified impacts to ensure that development projects do not unnecessarily expose people or structures to a significant loss, injury or death involving wildland fires. Significance is determined by answering the following guidelines:

Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The wildland fire risk in the vicinity of the Project sites has been analyzed and it has been determined that wildfires are likely occurrences, but would not be significantly increased in frequency, duration, or size with the construction of the Project (Dudek 2013). The Project would include non-combustible solar array construction, operation and maintenance structures, and related infrastructure. The site will be largely converted from readily ignited wildland chaparral fuels to ignition resistant facilities and equipment. The Project would not include full-time inhabitants, but would include increased human activity during construction and for ongoing Project operation and maintenance.

The types of potential ignition sources that currently exist in the area include vehicle and roadway, electrical transmission line, and machinery associated with rural residential, amongst others. The project would introduce potential ignition sources, but would also include conversion of ignitable fuels to lower flammability landscape and include 24 hour surveillance, resulting in faster observation and reporting of fires. With the conversion of the site's fuels, the Project is expected to function as a fire break that results in reduced fire spread, flame lengths and fire intensity based on the lower fuel volume that will be maintained throughout the site. Fires from off-site would not have continuous fuels across this site and would therefore be expected to burn around and/or over the site via spotting. Burning vegetation embers may land on Project structures, but are not likely to result in ignition based on ember decay rates and the types of non-combustible and ignition resistant materials that will be used on site. Ignition resistant materials of glass, steel, aluminum and decomposed granite will provide resistance to ignitions from embers. Understory fuels will be maintained at roughly 6 inches, so ignitions in the ground cover from embers would produce a fast moving, but low intensity fire through the highly compartmentalized fuel modification areas beneath the CPV trackers.

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The Project would comply with applicable fire codes and would include a layered fire protection system designed to current codes and inclusive of site-specific measures that will result in a Project that is less susceptible to wildfire than surrounding landscapes. Further, the facility will provide specific measures to reduce the likelihood of fire igniting on the site from necessary maintenance operations as well as measures to aid responding firefighters to the facility through direct site safety designs and training methods. The inclusion of measures provided through fair-share funding to the SDCFA in the Project's Fire and Emergency Protection Services Agreement (see PDF-PS-1) is required pursuant to the Safety Element of the County of San Diego General Plan to ensure acceptable emergency service response times~~results in effective mitigation of potential fire impacts~~. On-site personnel would be able to temporarily remain on site during a wildfire and there will be no permanent, habitable structures where people would remain overnight. Therefore, the project will not expose people or structures to a significant risk of loss, injury or death involving wildland fires.

PDF-PS-1 ~~To ensure that the Project would not impact fire and emergency response capabilities in the area, the Project will contribute the following equipment and funds towards local fire and emergency response capabilities~~As a condition to providing service and pursuant to the Safety Element of the General Plan, the applicant(s) shall enter into a fire and emergency protection services agreement with the San Diego County Fire Authority prior to approval of a Major Use Permit to make a fair share contribution to fund the provision of appropriate fire and emergency medical services, which includes but is not limited to:

- ~~• One Type VI Fire Engines for a total one-time estimated cost of \$190,000; actual costs may be more at the time of the execution of the agreement.~~
- ~~• Annual funding towards one Type VI Fire Engine Replacement for a total cost of \$19,000, with an annual escalator percentage to be determined.~~
- ~~• Annual funding towards one Type VI Fire Engine Maintenance Vehicle cost of \$9,000, with an annual escalator percentage to be determined.~~
- ~~• Annual funding for one~~ An initial Paramedic staff and startup equipment kit,, total annual cost of \$360,000; and ~~with an annual escalator percentage to be determined.~~
- ~~• Annual funding for one Paramedic staff firefighter, total annual cost of \$73,000, with annual 5% escalator~~ of the San Diego County Fire Authority Defensible Space Grant Program, at \$50/megawatt (MW) per final design of