Appendix K

Fire Protection Plan

FIRE PROTECTION PLAN

Suncrest Dynamic Reactive Power Support Project

APN: 523-040-080 (Portion of)

PDS-2015-IC-15-031

Prepared for:

County of San Diego, California

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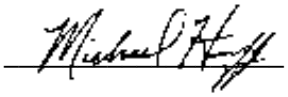

JUNE 2016

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EXECUTIVE SUMMARY

This Fire Protection Plan (FPP) is submitted pursuant to Section 4903 of the San Diego County Consolidated Fire Code to address the adverse environmental effects that the proposed Suncrest Dynamic Reactive Power Support Project (Proposed Project) may have from wildland fire. It provides analysis and documentation that the Proposed Project is consistent with the County significance checklist and does not expose people or structures to a significant risk of loss, injury or death involving wildland fires based on its conformance with applicable fire and building codes.

The Proposed Project will provide dynamic reactive power support at the existing San Diego Gas & Electric (SDG&E) Suncrest Substation, a 500 kV and 230 kV-level regional substation near Alpine, San Diego County, California. The Proposed Project will: (a) facilitate the importation and use of renewable electricity to fulfill California's energy policies and goals; (b) provide cost-effective voltage control and other electric transmission grid benefits; and (c) support the provision of safe, reliable, and adequate electricity service in the greater San Diego and Los Angeles metropolitan areas.

The Proposed Project addresses a need for voltage control and grid benefits. Certain types of renewable power sources, such as solar photovoltaic, do not provide reactive power at the same level as traditional generation sources, unless augmented by special equipment.

The Proposed Project site is located in a Very High Fire Hazard Severity Zone, as statutorily designated by the California Department of Forestry and Fire Protection (CAL FIRE) (FRAP 2014). Fire hazard severity zone designations are based on topography, vegetation, and weather, amongst other factors that indicate the likelihood of wildfire occurrence. The Proposed Project site is located in an area with historically fire adapted vegetation communities including chaparral and oak woodlands , which are vegetation communities that experience occasional wildfire and can burn in an extreme manner under the occasional severe fire weather (dry and windy) conditions that occur in the area. The terrain on the site gently slopes to the south and areas off-site may exceed 30 percent slopes to the south. Based on the region's fuels, fire history, and expected fire behavior, severe fires may occur, with moderate to severe-intensity fire expected to occur in the project area. The flat terrain and lighter fuels adjacent to the project site results in the anticipated moderate intensity fire behavior. The applicable County fire codes and additional measures required by this FPP directly address the fire concerns associated with this project's location.

Fire protection in the project area is shared by several agencies, with the San Diego County Fire Authority (SDCFA) and CALFIRE providing significant resources. The closest fire station is SDCFA's Descanso Station 45. Response to the Proposed Project from Station 45 will be

within the acceptable time frame as designated in the County General Plan. The Proposed Project will introduce an electrified facility and underground transmission line and related activities into a rural setting that currently includes semi-disturbed and undisturbed wildland fuels. There is no electricity generated at the site, but electricity passes through the facility. The Proposed Project may incrementally increase potential ignition sources in the area with the ongoing operation and maintenance program, but will reduce the available wildland fuels and will result in a higher level of fire monitoring and awareness due to Proposed Project monitoring and security measures. The project vicinity is currently subject to ignition sources including a major substation approximately 1 mile to the west, a significant electrical transmission line easement to the north of the property, roadways, and construction work occurring nearby, amongst others. The Proposed Project will include compliance with the San Diego County Consolidated Fire Code, as applicable, and will provide additional measures that enhance fire safety and protection.

1 INTRODUCTION

This Fire Protection Plan (FPP) has been prepared for the proposed Suncrest Dynamic Reactive Power Support Project (Proposed Project) in San Diego County, California. The purpose of the FPP is to assess the potential impacts resulting from wildland fire hazards and identify the measures necessary to adequately mitigate those impacts. As part of the assessment, this FPP has considered the property location, topography, geology (soils and slopes), combustible vegetation (fuel types), climatic conditions, and fire history. The plan addresses water supply, access (including secondary/emergency access where applicable), and structure ignitability and ignition resistive features, fire protection systems and equipment, impacts to existing emergency services, defensible space, and vegetation management. The plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect this project and its essential infrastructure. The plan recommends measures that the project developer will take to reduce the probability of ignition of vegetation, equipment or structures throughout the project area addressed by this plan.

This FPP is consistent with the 2014 County Consolidated Fire Code (CCFC), 2013 California Fire and Building Codes, 2016 CCR Title 14 SRAF Fire Safe Regulations and Fire Prevention Standards for Electric Utilities (CCR Title 14, Division 1.5, Chapter 7, Sections 1250-1258). Further, the Proposed Project is consistent with the County Building and Electrical Codes and will employ all related California Public Utilities Commission regulations including the General Order (GO) 95: Rules for Overhead Electric Line Construction, GO 128: Rules for Construction of Underground Electric Supply and Communication Systems, and GO 850: Outdoor Oil-Insulated Transformers.

The purpose of this FPP is to analyze the project's various components and siting in a fire hazard area and to generate and memorialize the fire safety requirements of the Fire Authorities Having Jurisdiction (FAHJ). Recommendations of this FPP incorporate analysis of the project and of the cumulative impact on the area's emergency service resources from foreseeable projects in the area. Recommendations for effectively mitigating identified impacts are based on site-specific characteristics and incorporate input from the project applicant and San Diego County Fire Authority (SDCFA)[1]. This FPP incorporates applicable fire safety regulations and requirements and documents a selection of these regulations that are most pertinent to the Proposed Project's unique facility and location.

[1] The Proposed Project is within the jurisdictional area of the San Diego County Rural Fire Protection District (SDCRFPD). In May 2015, the San Diego County Fire Authority (SDCFA) took the SDCRFPD under its umbrella and all fire responsibilities of the SDCRFPD are expected to be transferred to SDCFA by mid- to late-2016.

1.1 Project Summary

1.1.1 Project Location

The Proposed Project is located on privately owned lands in an unincorporated portion of San Diego County, approximately 33 miles from the Pacific Ocean. Specifically, it is located in the south central portion of San Diego County, approximately 3.8 miles southwest of the community of Descanso and approximately 3.4 miles southeast of the community of Alpine. The City of El Cajon is situated approximately 17 miles to the west. The Proposed Project will be constructed immediately south of Bell Bluff Truck Trail within an approximately six-acre portion of Assessor's Parcel Number (APN) 523-040-080. The project site is located in a portion of the northwest quarter of Section 3 of Township 16 South, Range 3 East, on the U.S. Geographical Survey (USGS), 7.5 minute, Viejas Mountain, California quadrangle map. The Proposed Project's location is illustrated in Figure 1, Project Vicinity Map.

Surrounding land use/ownership includes private and public lands in all directions. Low-density rural residential developments are present approximately 1.15 miles to the northeast and 0.8 mile to the southeast of the Proposed Project. Interstate 8 (I-8) is located approximately 1.8 miles to the north and Japatul Valley Road (State Highway 79) is located approximately 1.7 miles to the east.

The majority of the project site will be constructed in areas of San Diego County classified as a Very High Fire Hazard Severity Zone by CALFIRE (FRAP 2014).

1.1.2 Project Description

The Proposed Project involves two primary components: the Static Var Compensator (SVC) facility and the 230 kV single circuit underground transmission line (underground transmission line). The proposed SVC is an approximately 112,000-square-foot facility that would produce and consume reactive power and interconnect with the 230 kV bus of the existing SDG&E Suncrest Substation through the proposed underground transmission line, which is approximately 1 mile in length. The proposed transmission line will be installed underground within polyvinyl chloride (PVC) conduits in a concrete-encased duct bank system beneath an existing paved, private road known as Bell Bluff Truck Trail. At the western terminus of the approximately 1-mile-long underground transmission line, the conductors would surface at a riser pole structure where they would transition to a 300-foot-long overhead transmission line span and terminate into the existing Suncrest Substation's 230 kV bus.

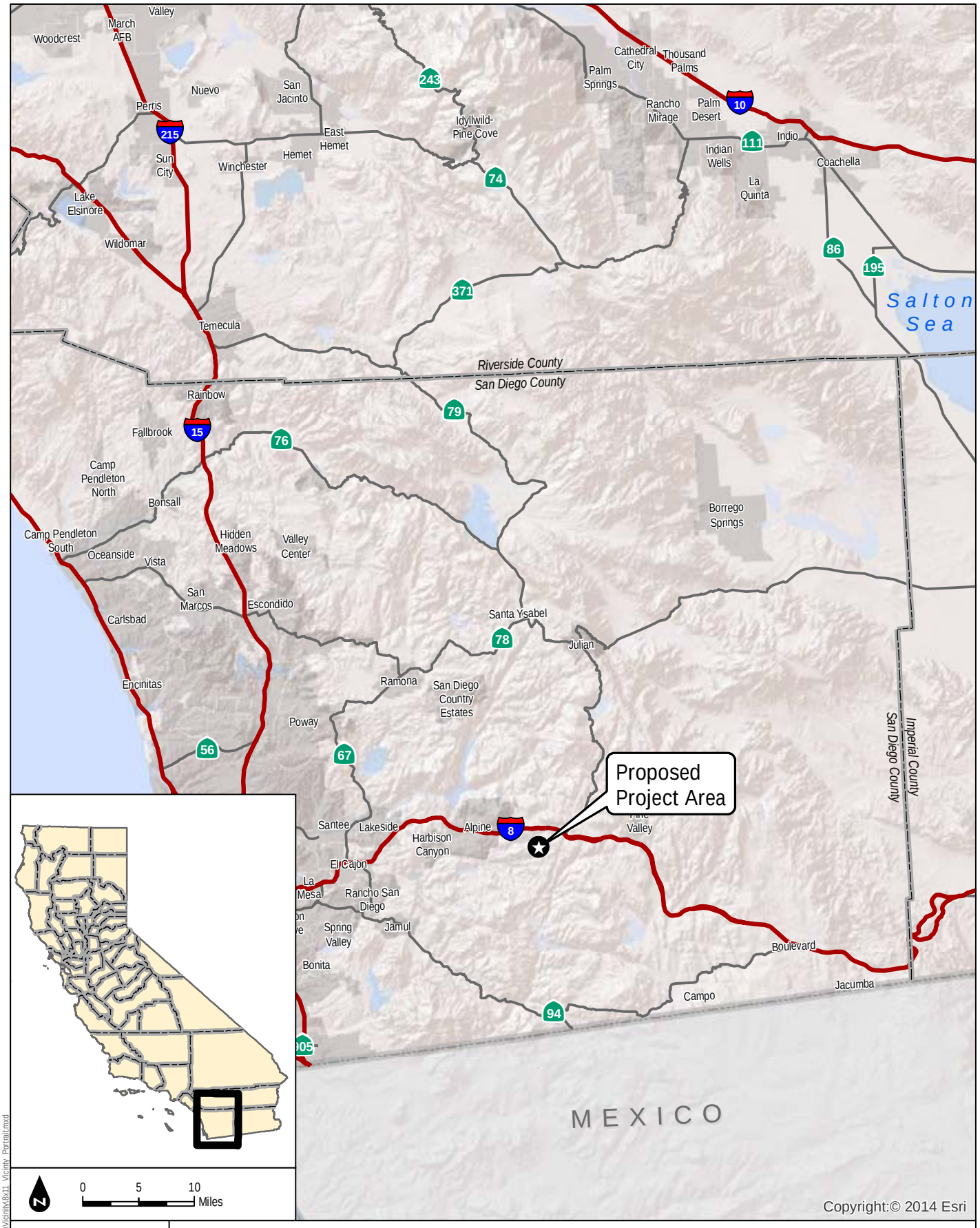

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FIGURE 1

Project Vicinity Map

Suncrest Dynamic Reactive Power Support Project FPP

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The project as shown on Figure 2: Project Overview Map will include the following main components:

- Construction of a new Static Var Compensator (SVC) facility with a rated real power output of 0 MW, and a nominal terminal voltage of 230 kV;
- Construction of two new access driveways to facilitate construction, operation, and maintenance of the SVC;
- Installation of a new approximately 1-mile 230 kV single-circuit underground electrical transmission line within a concrete-encased electrical duct bank between the SVC and the Suncrest Substation 230 kV bus;
- Installation of fiber optic cable within the same underground duct bank as the 230 kV cable to provide communications for line relaying, the Supervisory Control and Data Acquisition (SCADA) communications and control system, and other devices as required;
- Installation of up to five splice vaults to facilitate installation of the new underground cable and operation and maintenance of the transmission line;
- Installation of a 12 kV underground electrical distribution feed to the SVC; and,
- Installation of a riser pole approximately 85 to 95 feet in height north of the Suncrest Substation to transition the transmission line from underground to overhead to connect to the 230 kV bus.

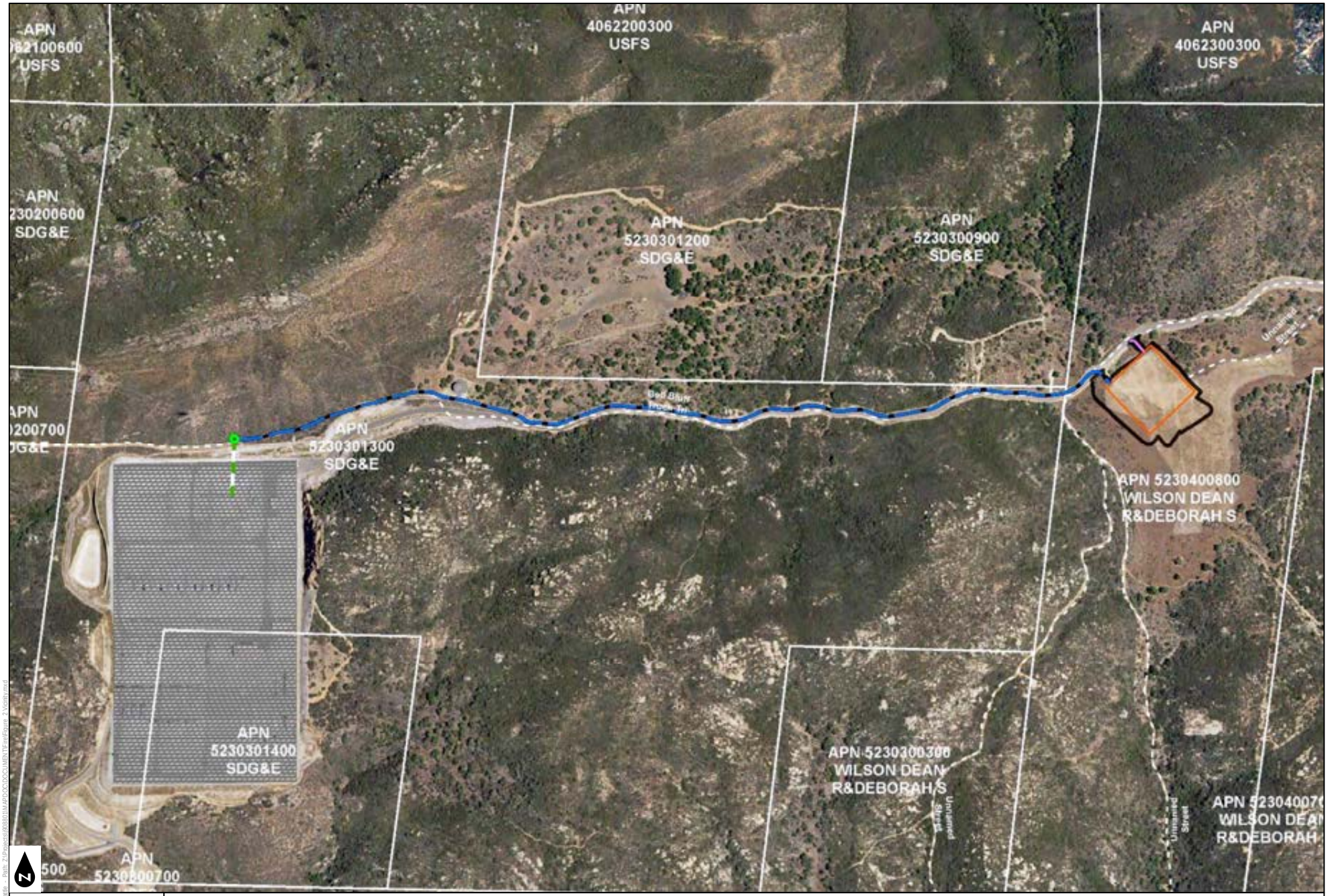
The Proposed Project components are described in the following sections and shown on Figure 3, Typical Plan View and SVC Arrangement and Figure 4, Typical Underground Duct Bank. Permanent Proposed Project components are summarized in Table 1.

Table 1
Proposed Project Components

Component	Quantity	Size (unit)	Description
SVC Facility	1	Approximately 6 acres total Approximately 2.58 acres fenced	SVC including all components and associated improvements (e.g., grading, access routes, retaining wall, stormwater management, etc.).
SVC Access Driveway	2	20 feet × 95 feet	New access driveways from the edge of Bell Bluff Truck Trail to the SVC.
Underground Transmission Line	1	Approximately 1 mile	230 kV single-circuit, three-phase underground electric transmission line from the SVC to a new riser pole outside Suncrest Substation.
Overhead Transmission Span – Interconnection to Suncrest Substation	1	300 feet	230 kV single-circuit, three phases from underground cable riser pole to Suncrest Substation.
Underground Splice Vaults	Up to 5	30 feet × 7 feet × 8 feet	Precast concrete, located within Bell Bluff Truck Trail.

1.1.2.1 Existing Transmission System

The Proposed Project consists of a SVC facility and a 230 kV single circuit underground transmission line that will connect to the existing SDG&E Suncrest Substation. The transmission system in the Proposed Project area includes the existing 500/230 kV SDG&E Suncrest Substation and the Sunrise Powerlink. The Suncrest Substation became operational in 2012 as part of the SDG&E Sunrise Powerlink Transmission Project. The purpose of the Suncrest Substation is to convert voltages along the Sunrise Powerlink Project's transmission line entering the substation from 500 kV to 230 kV. The substation is connected to the transmission line system by an existing SDG&E 500 kV overhead transmission line entering the substation from the south. The 500 kV transmission line is routed to the Suncrest Substation from Ocotillo and Imperial Valley Substations located to the east. Two SDG&E 230 kV overhead transmission lines exit the substation to the north connecting it with Sycamore Substation located to the west. The substation has been designed to accommodate one future 500 kV line and four future 230 kV lines. The proposed transmission line will parallel a double circuit SDG&E 230 kV transmission line on the north side of Suncrest Substation for approximately 300 feet.



SOURCE: Nextera Energy

FIGURE 2

Project Overview Map

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Suncrest Dynamic Reactive Power Support Project FPP

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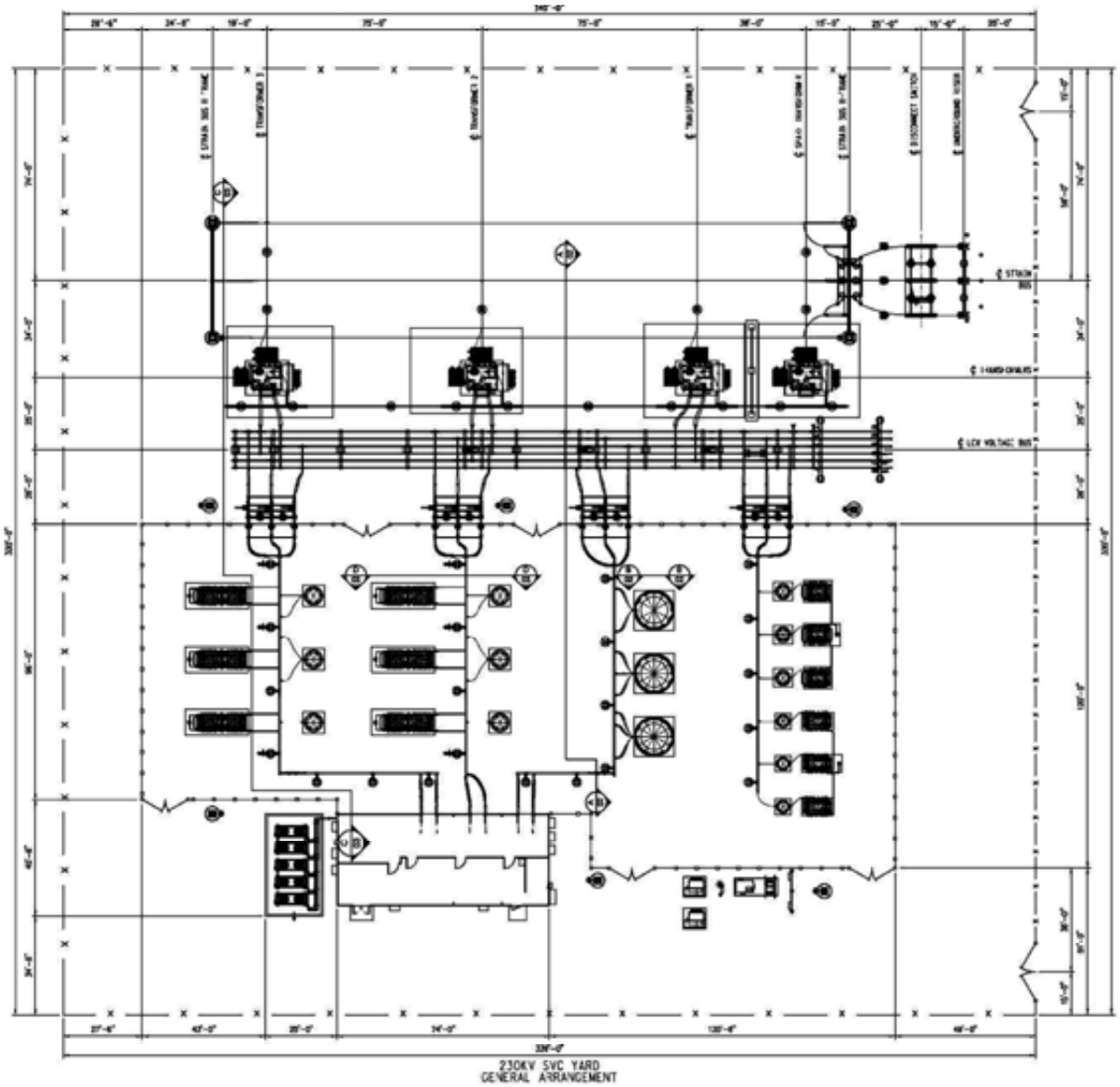

SOURCE: Nextera, 2015

FIGURE 3

SVC Typical View and General Arrangement Plan

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Suncrest Dynamic Reactive Power Support Project FPP

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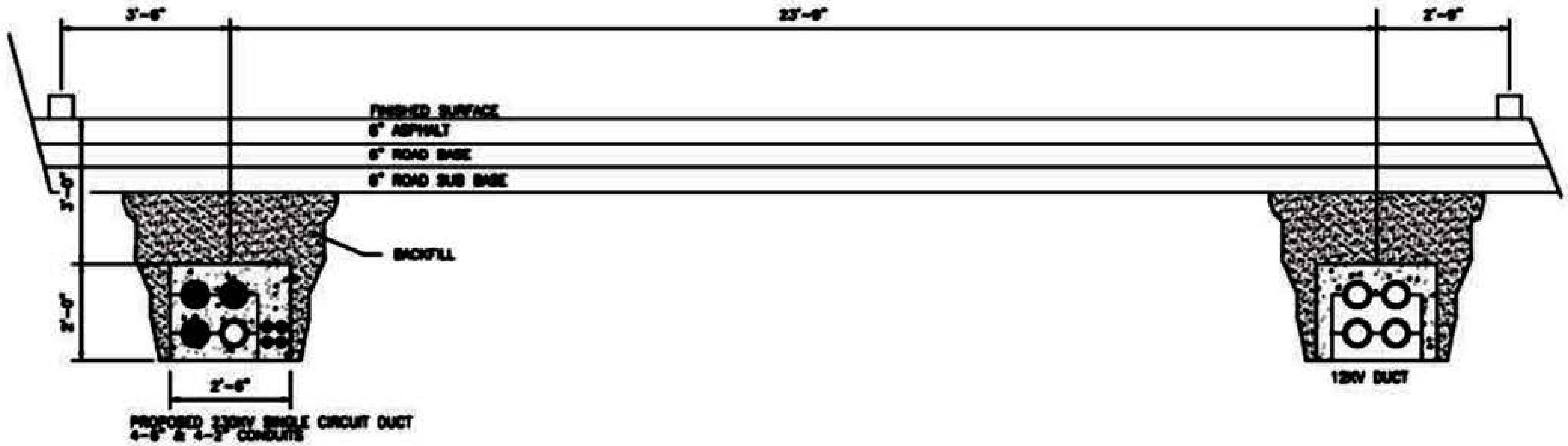
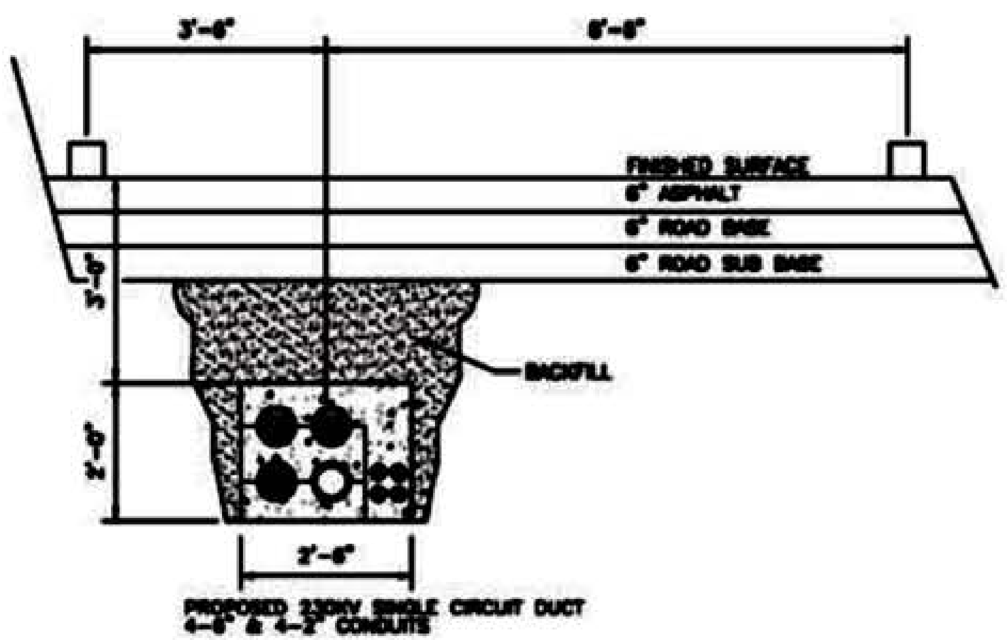


TYPICAL ROAD CROSS SECTION
BELL BLUFF TRUCK TRAIL



TYPICAL ROAD CROSS SECTION
BELL BLUFF TRUCK TRAIL (NORTH SIDE ROAD)

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SOURCE: Nextera

FIGURE 4

Typical Underground Duct Bank Plan

Suncrest Dynamic Reactive Power Support Project FPP

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1.1.2.2 Static Var Compensator (SVC) Facility

The proposed SVC will be constructed immediately south of Bell Bluff Truck Trail within a portion of Assessor's Parcel Number (APN) 523-040-080 in an area that was previously used as a construction laydown area for the Sunrise Powerlink. Construction of the SVC (e.g., limit of grading and associated site improvements based on current information) will occupy a total area of approximately 6.0 acres to be obtained in fee by NextEra Energy Transmission, West LLC (NEET West) prior to construction. Within the graded area, the SVC will be contained within a fenced area of up to approximately2.58 acres. The final design, layout, and footprint of the SVC will be procured through a functional specification detailing capacity, performance, available site area, and other requirements. The final design will generally incorporate a number of common components including the following contained within the SVC fenced area:

- Lightning Shielding Masts
- 230 kV Circuit Breaker
- 230 kV Main Stringbus and Busbar
- 230 kV Group Operated Air Break Switch
- 230 kV Lightning Arresters
- 230 kV Potential Measurement Transformers
- Three Single Phase 230 kV Main Power Transformers (plus One Spare) Outdoor HVAC Equipment and Thyristor/Convertor Cooling Equipment
- Outdoor Capacitor Banks
- Outdoor Air Core Reactors
- Outdoor Medium Voltage Busbars
- Outdoor Medium Voltage Instrument/Auxiliary Transformers
- Outdoor Medium Voltage Surge Arresters
- Outdoor Medium Voltage Group Operated Air Break Switches
- Control House of approximately 2,500 square feet of non-combustible construction containing the following equipment:
    - Thyristor Valves and/or IGBT Convertors
    - Protective Relaying and Control Equipment
    - SCADA Equipment

- Cooling Equipment
- AC/DC Auxiliary Power Equipment
- Spare Parts and Maintenance Tool Storage
- Miscellaneous Support Facilities

All major equipment (e.g., power transformers, power circuit breakers, control buildings, capacitors, and reactors) will be installed on concrete foundations. The maximum amount of oil required for the transformers at the SVC will be approximately 10,000 to 12,000 gallons for each of the four transformers. Secondary containment basins will be provided for each piece of equipment, including internal oil storage and transformers. The basins will be designed to retain 100 percent of the oil plus 24-hour 25-year storm in the transformer or storage area. Outdoor oil-insulated transformers will be separated from adjacent structures and from each other by firewalls for the purpose of limiting damage and potential spread of fire from a transformer failure. Determination of the type of physical separation between transformers, control equipment, and building structures will be in accordance with NFPA 850, Section 5.1.4. Outdoor Oil-Insulated Transformers. The tallest structures within the SVC will be the approximately 75-feet high lightning shielding masts. The general layout and arrangement of the outdoor equipment of a typical SVC of this approximate size is shown in Figure 3, SVC Typical Plan View and General Arrangement.

In addition to the electrical equipment, the SVC will include the following facilities or components for the site design:

- Signage and lighting;
- Access road improvements;
- A stormwater detention basin;
- A retaining wall, stormwater drainage ,and conveyance system;
- Chain link and barb wire security fencing approximately 7 feet in height with a secure gate accessible only by NEET West staff and emergency services personnel; and,
- Transformer oil containment basins designed to contain the oil volume of the transformers plus the 25 year 24-hour storm.

All facilities at the SVC, including the associated access drives and stormwater drainage and conveyance system, will occur within the property line of the approximately 6-acre parcel to be owned by NEET West.

1.1.2.3 Underground Transmission Line

An underground electric transmission line will connect the proposed SVC to the existing SDG&E Suncrest Substation. The proposed transmission line will be a new 230 kV single-circuit line composed of cross-linked polyethylene-insulated, solid-dielectric, copper or aluminum conductor cables. For a single-circuit line, there will be three separate cables installed within PVC conduits in a concrete-encased duct bank system. In addition to the 230 kV cables, a fourth spare PVC conduit will be installed in the duct bank to facilitate installation of a spare cable in the event of a failure occurs. There will be four smaller conduits for fiber optics to provide communications for line relaying, SCADA, and other devices as required. Dimensions of the overall duct bank are approximately 30 inches wide by 24 inches tall. Up to five underground splice vaults will be installed along the transmission line alignment about every 900 feet to facilitate installation of the underground cables and to operate and maintain the transmission line following construction. The new transmission line will be approximately 1.0 mile in length and include a permanent Right-of-Way that will be approximately 12-feet-wide.

The proposed transmission line will be installed within the curbs of the existing Bell Bluff Truck Trail. The proposed underground transmission line will parallel an existing underground 12 kV distribution line owned by SDG&E, which is located on the south side of Bell Bluff Truck Trail, for approximately 3,400 feet. From the intersection of Bell Bluff Truck Trail and SDG&E's substation access road to the riser structure, NEET West anticipates having to cross a 12 kV distribution feeder (powering a communication site on the north side of Suncrest Substation), and the water pipe connecting SDG&E's water tank to the Suncrest Substation. Existing utilities and culverts within the roadway will be located and potholed prior to construction to ensure proper separation and avoidance by the proposed underground transmission line. Separation will be in accordance with CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communication Systems.

Final entry into the Suncrest Substation will be via an approximately 300-foot-long overhead span. The underground transmission line will be routed to a new self-supporting riser pole installed north of Bell Bluff Truck Trail outside of the Suncrest Substation. The riser pole at the end of the underground alignment where the line transitions to overhead will be located on the road shoulder just north of Bell Bluff Truck Trail. This riser pole will be between 85 and 95 feet tall and located just outside the pavement on the north side of Bell Bluff Truck Trail and approximately 250 feet southeast from the nearest, 142-foot-tall 230 kV Sunrise Powerlink transmission tower. The base of the riser pole has a diameter of approximately 7 feet and an approximate 15-foot radius of permanent clearance will be required around the riser pole, per GO-95 Rules.

1.1.3 Construction Fire Prevention Plan

This FPP is applicable to the ongoing Operation and Maintenance (O&M) of the Proposed Project. This FPP is not intended to apply to the construction phases of the Proposed Project. A separate "Construction Fire Prevention Plan" (CFPP) document shall be prepared, reviewed and approved by SDCFA and CALFIRE a minimum of 45 days prior to construction activities associated with this Proposed 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 Proposed Project. The Conceptual CFPP includes discussion of the following fire safety, prevention, and protection topics:

Conceptual Construction Fire Prevention/Protection Plan

1. INTRODUCTION

   This section will identify the intent of the CFPP for the Proposed Project and which mitigation measures the plan satisfies, if any.

   All construction work shall follow these guidelines and commitments. The contents of this plan are to be incorporated into the standard construction contracting agreements for the construction of the project. Primary plan enforcement and implementation responsibility will remain with the project applicant and its contractors and vendors. Copies of this plan shall be given to all contractors, and a kick-off safety meeting will be conducted. Workers shall sign a form stating they received this training.

2. REQUIREMENTS

   This section will identify specific requirements of the plan, which shall be implemented to the satisfaction of the fire authorities having jurisdiction, which include the SDCFA and CAL FIRE (jointly, the Fire Agencies). The following is an outline of requirements for the CFPP.

   A. Construction Fire Prevention Plan Definitions

   B. Project Description

   C. Project Fire Risks

   D. Fire Risk Mitigation Measures

   E. Staging Areas and Major Operation Work Sites

   F. Project Tool and Equipment Requirements

G. Agency Specific Requirements

H. Construction of Access Roads Prior to On Site Construction

I. Training

J. Water Storage Tanks: ID location and capacity.

K. Fire Safety Coordinator: This position is required by the California Fire Code Section 1408.1.

L. Safety briefings, Inspections and Compliance

M. Road Widths and Roadside Fuel Modification

N. Fuel Modification at Construction Sites

O. Fire Patrols

P. Firefighting Pump Units

Q. Construction Water Tenders

R. Portable Fire Extinguishers

S. Red Flag Warnings; High Fire Hazard Weather Conditions

T. Project Specific No Work Provisions/Restrictions

U. Agency Specific Requirements

V. Tool Caches

W. Mufflers and Spark Arrestors on Equipment Engines

X. Use of Portable Equipment

Y. Clearing Crews

Z. Storage of Flammable and Combustible Liquids and Fueling of Vehicles and Equipment

AA. Temporary Heating Devices

BB. Storage Areas and Parking Areas

CC. Designated Smoking Areas

DD. Warming and Lunch Fires; No Open Burning

EE. Hot Work (Welding, Grinding, etc.): These requirements are primarily from California Fire Code (CFC) Chapter 26, “Welding and other Hot Work,” and NFPA 51-B, “Fire Prevention During Welding, Cutting and other Hot Work”.

FF. Storage of Combustibles and Trash

GG. Storage and Use of Hazardous Materials

HH. Warehouses and Construction offices

II. Construction office trailers or modular buildings:

JJ. Temporary Construction Materials:

KK. II. Turbine Construction

LL. Power Line and Structures

MM. Temporary Wiring and Electrical and Heating Equipment

NN. First Aid

OO. Communications Plan

PP. Emergency Alarms

QQ. Calling 911

RR. Emergency Plan

SS. Visitors

TT. Checklists

1. Fire Safety Coordinator
2. Construction Fire Watch
3. Construction Crewmembers
4. Construction Supervisors
5. Example Contents of the Required Laminated Card

3. SUMMARY

This section will summarize that the CFPP has been prepared in response to the requirements of the Fire Agencies and will state the limitations of the requirements listed above, if any. For example, requirements made by the representatives of the Fire Agencies can overrule items in this CPPF.

4. DISCLAIMER

This section will provide the disclaimer that the CFPP does not guarantee a fire or other emergency will not occur or cause property damage, injury or loss of life. However, it will also discuss that if the CFPP is complied with, the construction operation should be reasonably fire safe.

5. APPENDICES

   Appendices may include maps, contact information, excerpts from the California Public Resources Code and other applicable regulations.

1.1.4 Environmental Setting

Following extensive review of available digital site information, including topography, vegetation types, fire history, and the Proposed Project's site plan, Dudek fire protection planners conducted a field assessment of the Proposed Project on September 25, 2015, in order to confirm digital data and fill any identified data gaps

Among the field tasks that were completed are:

- Vegetation estimates and mapping refinements
- Fuel load analysis
- Topographic features documentation
- Photograph documentation
- Confirmation/verification of hazard assumptions
- Ingress/egress documentation.

Site photographs were collected (Appendix A: Photograph Log) and fuel conditions were mapped using aerial images. Field observations were utilized to augment existing site data in generating the fire behavior models and formulating the requirements provided in this FPP.

1.1.4.1 Topography

Located in east San Diego County, the Proposed Project site is located approximately 33 miles east of the Pacific Ocean and situated in the Laguna Mountains of the Peninsular Range. Topography in the vicinity of the Proposed Project area is undulating with steep hills interspersed by narrow valleys and deep canyons. The Proposed Project site occurs on a ridgeline which trends approximately west to east with Viejas Mountain to the west and Japatul Valley to the south. Topography on the Proposed Project site is gentle slopes (less than 5%) and then drops off to steeper terrain (30%) that drains to the south via a steeply incised drainage into Japatul Valley. Site elevations range from approximately 3,000 to 3,200 feet above mean sea level.

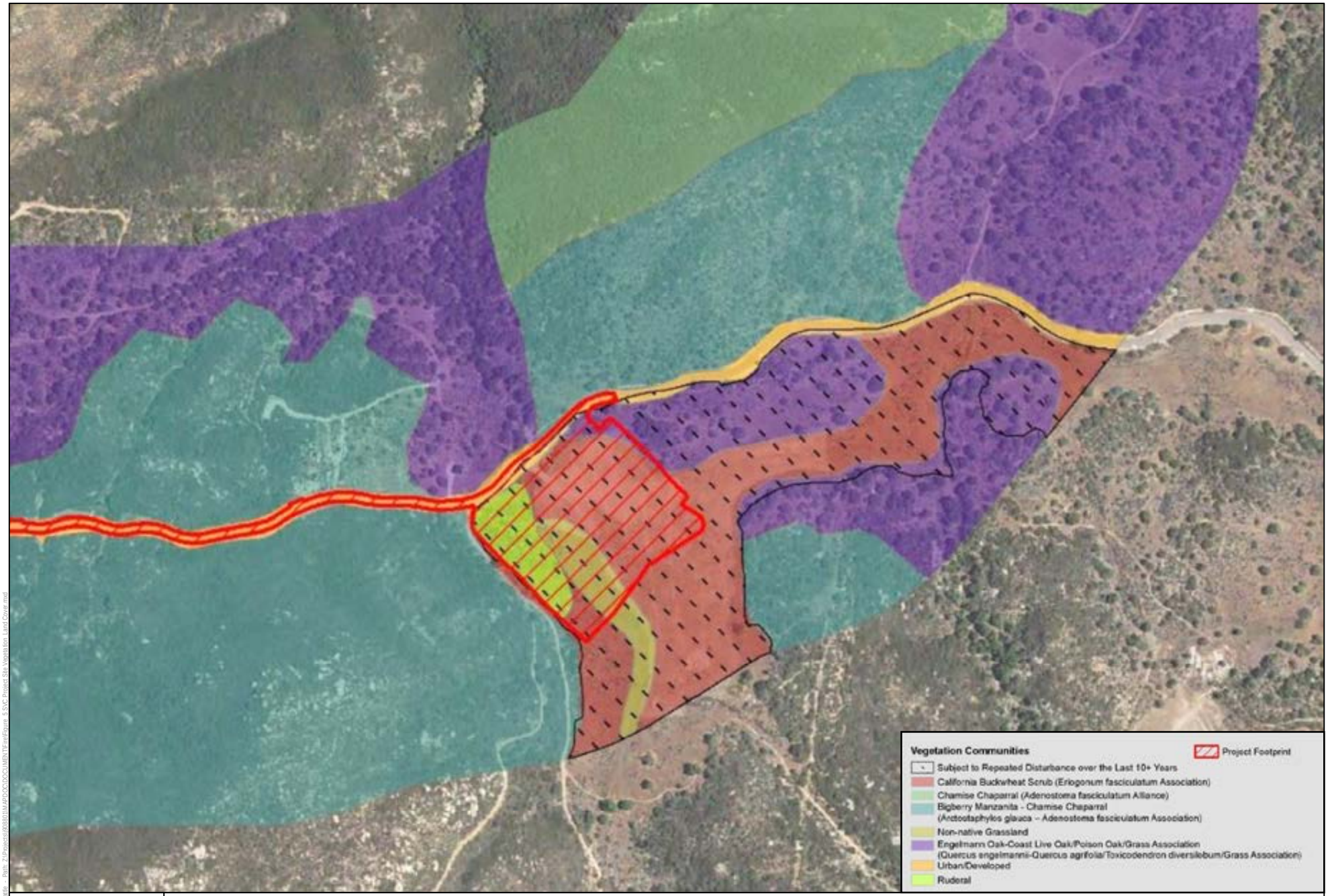
1.1.4.2 Vegetation

The footprint of the Proposed Project and surrounding habitats consist of undeveloped chaparral scrub and oak woodlands with pockets of disturbance dominated by non-native grasses and forbs. There are six vegetation communities and one land cover type in the Proposed Project area, including urban developed, Engelmann and Coast Live oak woodlands, Chamise chaparral, Califronia buckwheat scrub, Bigberry Manzanita-chamise chaparral, Non-native grassland, and ruderal. The acreage of each of these vegetation communities/land cover type are provided in Table 2 and their spatial distribution on the site is illustrated in Figure 5 As indicated, California buckwheat scrub and Non-native grasslands are the most common plant communities on the project site. Bigberry Manzanita- Chamise chaparral and Engelmann-Coast Live oak woodlands are also the most common plant communities adjacent to the site, which represents the fuels that would spread wildfire toward or away from the Proposed Project. Both vegetation types were modeled in Section 3.

Table 2
Proposed Project Vegetation Communities and Land Cover*

Vegetation Community/Land Cover	Acres**	Percentage Cover
Upland Scrub and Chaparral		
California Buckwheat Scrub	4.5	58.4%
Woodlands		
Engelmann Oak-Coast Live Oak	0.3	3.9%
Non-Native Communities and Land Covers		
Non-native Grassland	1.1	14.3
Ruderal	1.7	22.1
Urban Developed	0.1	1.3%
Total	**7.7**	**100.0%**

Note:
* Source: Proponent's Environmental Assessment, August 2015
** Acreage totals do not include vegetation types adjacent to transmission line alignment along Bell Bluff Truck Trail Road.



SOURCE: Nextera Energy Transmission West, LLC - 2015

FIGURE 5

SVC Project Site Vegetation/Land Cover

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Suncrest Dynamic Reactive Power Support Project FPP

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In addition to the SVC site, the transmission line and vaults traverse underneath Bell Bluff Truck Trail Road (3.1 acres) with small patches of Chamise Chaparral (0.4 acre), California Buckwheat Scrub (<0.1 acre), and oak woodlands (< 0.1 acre) that are adjacent to the road. Descriptions of all vegetation types on or adjacent to the site are as follows:

Engelmann Oak-Coast Live Oak Woodlands

Stands of Engelmann oak (*Quercus engelmannii*) and coast live oak (*Q. agrifolia*) occupy the north central and eastern portions of the Proposed Project area, particularly along streams or in moist declivities. Engelmann and coast live oak trees occur as co- dominants forming a sometimes closed tree canopy with poison oak (*Toxicodendron diversilobum*) in the shrub canopy, and grasses and other herbs forming the herbaceous understory. Common grasses in this association include the non-native slender wild oats (*Avena barbata*), soft chess (*Bromus hordeaceus*), cheatgrass (*B. tectorum*), red brome (*B.madritensis* ssp. *rubens*), and ripgut brome (*B. diandrus*); native grasses include purple needlegrass (*Stipa pulchra*) and muhly grasses (*Muhlenbergia* spp.). Subdominant shrubs vary by location, and often include coastal sage scrub species such as black sage (*Salvia mellifera*), white sage (*S. apiana*), California sagebrush (*Artemisia californica*), laurel sumac (*Malosma laurina*), and bush monkey flower (*Mimulus aurantiacus*).

Chamise Chaparral

The chamise chaparral habitat occurs in the northwestern and northeastern Project area limits of the Proposed Project. Chamise chaparral is dominated by sometimes monotypic (single species) stands of the dominant species, chamise (*Adenostoma fasciculatum*). This is the dominant dark green scrub of dry slopes, where soils occur over bedrock, forming a dense canopy layer up to 12 feet tall. Generally devoid of an herbaceous layer, other shrubs that typically grow in this plant community include manzanitas (*Arctostaphylos* spp.), chaparral yucca (*Hesperoyucca whipplei*), white sage, laurel sumac, black sage, Mexican elderberry (*Sambucus nigra* ssp. *caerulea*), California buckwheat (*Eriogonum fasciculatum*), and deerweed (*Acmispon glaber*).

California Buckwheat Scrub

There is a stand of California buckwheat south of Bell Bluff Truck Trail that consists of a mix of occasionally disturbed and highly disturbed/planted scrub species heavily dominated by California buckwheat (*Eriogonum fasciculatum*). The planted species are for restoration of a laydown yard used during construction of the SDG&E Sunrise Powerlink. The planting area is located within the Proposed Project site.

Bigberry Manzanita – Chamise Chaparral

On granitic slopes within the study area, chamise sometimes associates with bigberry manzanita (*Arctostaphylos glandulosa*) to form dense, closed canopy, scrub. Scrub oak (*Quercus berberidifolia*), chaparral yucca, and ceanothus species (*Ceanothus* spp.) also grow as subdominant shrubs in this plant community Herbaceous layers are uncommon in chamise-dominated scrub, except following fires. This plant community is immediately adjacent to the Proposed Project footprint along the west, southeast and north sides.

Non-native Grassland

Non-native Grasslands are annual grasslands once dominated by a host of native species that now form continuous herbaceous layers dominated by non-native grasses and herbs including slender wild oats, soft chess, cheatgrass, red brome, ripgut brome, red-stemmed filaree (*Erodium cicutarium*), and short-pod mustard (*Hirschfeldia incana*). Native species may include western ragweed (*Ambrosia psilostachya*), lupines (*Lupinus* spp.), doveweed (*Croton setigerus*), and Parish's bluecurls (*Trichostema parishii*).

Within the Project area, Non-native Grassland occurs in small patches where past disturbance created favorable conditions for the associated invasive non-native and tolerant native species; a large patch of Non-native Grassland occurs in the laydown yard used during construction of the SDG&E Sunrise Powerlink, where the SVC facility is proposed.

Ruderal

Ruderal areas are highly disturbed areas and are dominated by non-native species that have high rates of seed dispersal, fast growth, and are able to quickly colonize disturbed areas. In the vicinity of the Proposed Project, non-native grasses would typically quickly colonize ruderal areas. Bare earth and ruderal land occurs on the northwest side of the SVC site where vegetation has been cleared and the area graded by the property owner for the installation of a temporary water tank.

Urban Developed

The Urban Developed category is reserved for portions of the study area no longer covered by vegetation. It includes roads, permanent facilities, and other sites paved or built upon that exclude plants. This cover type occurs along the paved road (Bell Bluff Truck Trail) between the SVC facility and the SDG&E Suncrest Substation.

The Proposed 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 grasses and forbs that will be mowed or weed whipped, annually. The underground transmission line 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 Section 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.

The fuel load is the amount of fuel available to wildfire. Shrub dominated plant communities tend to include higher fuel loads than grass dominated plant communities. Tree dominated communities may include higher fuel loads than shrub dominated landscapes. However, there are many other facets of fire behavior that govern fire ignition and spread. Therefore, because an area may include higher fuel loads, it does not necessarily mean that it presents a higher fire risk.

As previously mentioned, the vegetation along the perimeter of the proposed SVC site and approximately 300 feet from the fuel modification zone is the area of highest concern for determining what effects wildfire may have on the project's structure. It is these fuels, which if ignited, would burn up against the provided fuel modification zones as it gets closer to the built portions of the Proposed Project.

Vegetation distribution is relatively consistent in all directions from this site and consists of Bigberry Manzanita-Chamise chaparral with large patches of Engelmann Oak-Coast Live Oak woodlands. Fuel loads for the chaparral vegetation type is estimated to be 8.6 tons/acre, whereas the oak woodland fuel bed is estimated to be 2.6 tons/acre. Fires burning in both fuel types often display moderate fire intensity and thresholds for spread that are observed to depend on environmental factors like wind or slope.

1.1.4.4 Fire History

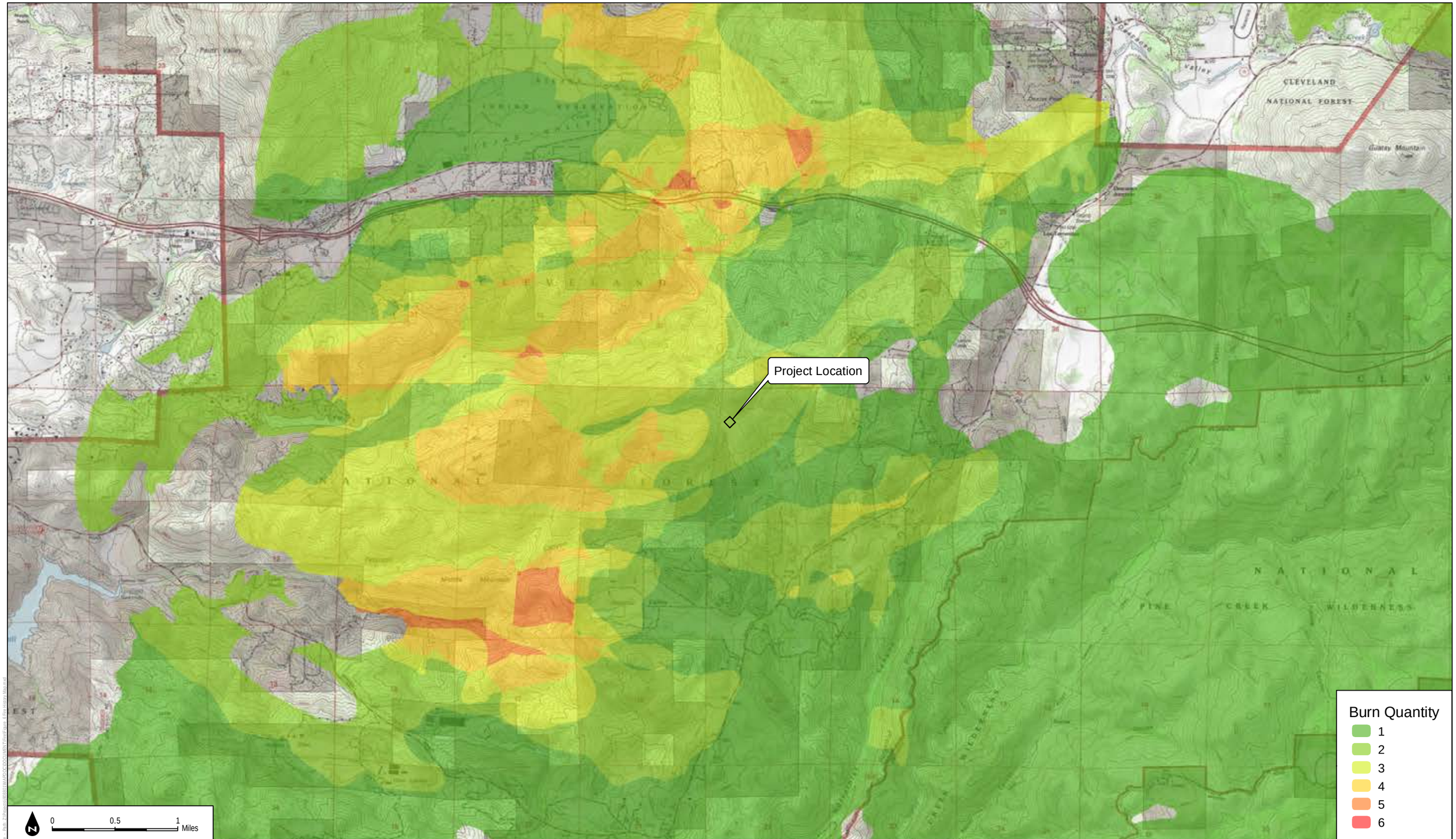
Fire history data provides valuable information regarding fire spread, fire frequency, ignition sources, and vegetation/fuel mosaics across a given landscape. One important use for this information is as a tool for pre-planning. It is advantageous to know which areas may have burned recently and therefore may provide a tactical defense position, what type of fire burned on the site, and how a fire may spread. According to available data from the California Department of Forestry and Fire Protection's Fire and Resource Assessment Program (FRAP) database

(CALFIRE FRAP 2014), there have been 25 fires recorded within 5 miles of Project vicinity since 1911. Of the total 25 fires, there have only been two fires over the last 104 years that burned small portions of the Proposed Project property. The most notable fire (Laguna) occurred in September-October1970, and burned approximately 175,425 acres in the southern portion of the County, including the Project Area. SDCFA may have data regarding other smaller, undocumented fires that have occurred on the site that have not been included herein based on their small size (fires less than 10 acres are not recorded by CALFIRE). Table 3 presents fire history within five miles of the Proposed Project Site since 1910 and Figure 6 provides a graphical representation of the quantity of times the landscape has burned in the area.

Table 3
Fire History in the Proposed Project Area

Fire Year[1]	Fire Name	Total Area Burned (acres)
1911	Un-named	7,307
1912	Un-named	438
1915	Un-named	197
1921	Un-named	788
1923	Un-named	87
1924	Un-named	5,166
1933	Un-named	70
1938	Un-named	65
1942	Un-named	571
1943	Un-named	3,910
1943	Un-named	985
1947	Un-named	32
1948	Un-named	516
1948	Un-named	448
1948	Un-named	135
1950	Conejos	62,848
1953	Viejas	707
1968	Un-named	876
1969	Un-named	668
1970	Laguna	175,425
1982	Sweetwater #2	42
1992	Loveland	2,080
2001	Viejas	10,438
2003	Cedar	280,278
2014	Viewpoint	17

[1] Based on polygon GIS data from CAL FIRE's Fire and Resource Assessment Program (FRAP), which includes data from CAL FIRE, USDA Forest Service Region 5, BLM, NPS, Contract Counties and other agencies. The data set is a comprehensive fire perimeter GIS layer for public and private lands throughout the state and covers fires 10 acres and greater between 1878–2013.



SOURCE: USGS, 2015; Cal Fire, 2014

FIGURE 6

Fire History Map

Suncrest Dynamic Reactive Power Support Project FPP

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Based on an analysis of this fire history data set, specifically the years in which the fires burned, the average interval between wildfires in the area (includes areas up to roughly 5 miles from the Proposed Project site) was calculated to be 4.7 years with intervals ranging between 1 and 15 years. Based on this analysis, it is expected that wildfire that could impact the SVC facility may occur, if weather conditions coincide, roughly every five years with the realistic possibility of shorter interval occurrences, as observed in the fire history records. Further, the large expanses of open space surrounding the Proposed Project site and potential ignition sources along I-8 and Hwy 79, contribute to increased potential risk and wildfire hazard in the area.

1.1.4.5 Climate

Eastern San Diego County and the project area are influenced by the Pacific Ocean and are frequently under the influence of a seasonal, migratory subtropical high pressure cell known as the "Pacific High" (WRCC 2014). Wet winters and dry summers with mild seasonal changes characterize the Southern California climate. This climate pattern is occasionally interrupted by extreme periods of hot weather, winter storms, or dry, easterly Santa Ana winds. In the vicinity of the Proposed Project, the average temperatures in January range from 42 degrees Fahrenheit (°F) at night to 65°F during the day. The warmest month is August, when high temperatures average 91°F. Precipitation typically occurs between November and April with rainfall averaging about 16 inches per year (WRCC 2015a)[2]The prevailing wind pattern is most frequently from the west-southwest (on-shore), but the presence of the Pacific Ocean causes a diurnal wind pattern known as the land/sea breeze system. During the day, winds are from the west–southwest (sea) and at night winds are from the northeast (land). During the summer season, the diurnal winds may average slightly higher than the winds during the winter season due to greater pressure gradient forces. Surface winds can also be influenced locally by topography and slope variations. The highest wind velocities are associated with downslope, canyon, and Santa Ana winds. The majority of the time the winds were calm (less than 1.3 miles per hour [mph]). The average wind speed for the period was approximately 2.4 mph (WRCC 2015b).

The project area's climate has a large influence on the fire risk as drying vegetation during the summer months becomes fuel available to advancing flames should an ignition be realized. Typically the highest fire danger is produced by the high-pressure systems that occur in the Great Basin, which result in the Santa Ana winds of Southern California. Sustained wind speeds recorded during recent major fires in San Diego County exceeded 30 mph and may exceed 50 mph during extreme conditions. The Santa Ana wind conditions are a reversal of the prevailing

[2] Historical weather data for Alpine, California, NWS Co-op Station 040136 (approximately 6.2 miles west-northwest from the Proposed Project site) from 11/1/1951 to 1/20/2015.

southwesterly winds that usually occur on a region-wide basis during late summer and early fall. Santa Ana winds are warm and dry winds that flow from the higher desert elevations in the north through the mountain passes and canyons. As they converge through the canyons, their velocities increase. Consequently, peak velocities are highest at the mouths of canyons and dissipate as they spread across valley floors. Santa Ana winds generally coincide with the regional drought period and the period of highest fire danger. The project site is affected by Santa Ana winds.

1.1.4.6 Current Land Use

The Proposed Project area currently consists of a mixture of semi-rural residential developed lands and open space in both private and federal land holdings. The Proposed Project site is located on privately owned lands within the administrative boundary of the United States Forest Service-Cleveland National Forest. SDG&E privately owned lands, including the Suncrest Substation, are within one mile of the Project limits on the west side and the Cleveland National Forest lands are to the north of the Proposed Project site. Individual, private ownerships occur to the east and south of the Proposed Project site.

Based on a review of topographic maps and aerial photography, as early as 1953 a large portion of this parcel, including the proposed SVC area, appears to have been cleared, likely for livestock grazing purposes. From 1953 onward the land where the SVC will be constructed remained largely cleared of dense or woody vegetation consisting predominantly of grasses and forbs. During the construction of the Sunrise Powerlink Transmission Project the proposed SVC area was used as a materials staging area and was completely graded and cleared of vegetation. Following completion of construction, the area has been in a process of revegetation, including active planting and restoration activities by SDG&E, and has largely been undisturbed.

While the Proposed Project area is bound nearly in all directions by undeveloped vegetated lands, several features of the built environment are present in the immediate vicinity. The Suncrest Substation constructed in 2012, is located at the western terminus of the proposed transmission line approximately one mile west of the location of the proposed SVC. Several localized development improvements were made within the area during construction of the Suncrest Substation and the larger SDG&E Sunrise Powerlink Transmission Project. Bell Bluff Truck Trail, a dirt road, was widened to 30 feet and paved to provide access to the Suncrest Substation. The Proposed Project site will be accessed from Bell Bluff Truck Trail Road.

1.1.4.7 Proposed Land Use

The Proposed Project has two primary components, the SVC facility, and a 230 kV single-circuit, underground transmission line connecting the SVC to the existing Suncrest Substation owned and operated from SDG&E. The Project would include removal of existing vegetation from the Proposed Project site, grading to create flat pad area, construction of a new SVC facility that will be connected to SDG&E Suncrest substation via a 230 kV underground transmission line. The SVC facility is planned to be constructed on the 6.0-acre development site. The Project land use would include access road, an on-site water storage tank, a chain link perimeter fence, and related infrastructure for the SVC facility, as described herein.

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2 ANTICIPATED FIRE BEHAVIOR

2.1 Fire Behavior Modeling

Following field data collection efforts and available data analysis, fire behavior modeling was conducted to document the type and intensity of fire that would be expected on this site given characteristic site features such as topography, vegetation, and weather. The BehavePlus 5.0.5. fire behavior modeling software package, which is the latest version of this industry standard fire behavior prediction software, was utilized in evaluating anticipated fire behavior adjacent to proposed fuel modification zones for the perimeter of the Proposed Project's developed area. Results are provided below and a more detailed presentation of the BehavePlus modeling methodology, including fuel moisture and weather input variables, is provided in Appendix B.

2.1.1 BehavePlus Fire Behavior Modeling Results

Fire Behavior results derived from the BehavePlus modeling efforts are presented in Table 4 and in Figure 7. Four focused analyses (fire scenarios) were completed, each assuming worst-case fire weather conditions for a fire approaching the Proposed Project site primarily from the northeast or west-southwest. These fire scenario areas, which were directly adjacent the fuel modification zones and around the perimeter of the Proposed Project site, were modeled as a Bigberry manzanita-chamise chaparral (Fuel Model Sh5) or as an Engelmann oak-Coast live oak woodlands with grass-shrub understory (Fuel Model Gs2). This detailed analysis compared fire behavior adjacent to the proposed development with outputs including flame length (feet), rate of spread (mph), and fireline intensity (BTU/ft/s).

Table 4
BehavePlus Fire Behavior Modeling Results

Model Run	Fuel Model(s)	Flame Length (feet)	Fireline Intensity (Btu/ft/s)	Surface Rate of Spread (mph)
1	Sh5	63.7	47,368	14.3
2	Gs2, Sh5	30.2 to 63.6	9,392 to 47,294	9.6 to 14.3
3	Gs2, Sh5	10.6 to 26.2	956 to 6,883	1.2 to 2.4
4	Gs2, Sh5	10.6 to 26.2	952 to 6,898	1.2 to 2.4

Based on the results of BehavePlus analysis, worst-case fire behavior is expected in Bigberry manzanita-chamise chaparral fuels along the northern and eastern edges of the proposed development during a strong (Santa Ana) wind-driven fire event (Scenarios 1 and 2). Under such extreme weather conditions, flame lengths in this shrub fuel bed will approach 63.7 feet with fire

spread rates reaching approximately 3.4 mph due to high winds and very low fuel moistures. On the contrary, wildfires occurring during on-shore wind patterns (Scenarios 3 and 4) are expected to be of low to moderate severity with flames lengths of 26.2 feet and slower spread rates (approximately 2.4 mph) due to higher fuel moisture content and reduced wind speeds.

The results presented in Table 4 depict values based on inputs to the BehavePlus software and are not intended to capture changing fire behavior as it moves across a landscape. Changes in slope, weather, or pockets of different fuel types are not accounted for in this analysis. For planning purposes, the averaged worst-case fire behavior is the most useful information for conservative fuel modification design. Model results should be used as a basis for planning only, as actual fire behavior for a given location will be affected by many factors, including unique weather patterns, small-scale topographic variations, or changing vegetation patterns. As such, the proposed 100-foot FMZ width will be approximately 1 ½ times wider than the calculated flamelengths for a fire under very low fuel moistures and high wind conditions.

2.2 On-Site Risk Assessment

As presented, the chaparral and oak woodlands' fuel beds in the area surrounding the Proposed Project site would be the fuels affecting the constructed project. Based on the observed fuel beds surrounding the site, off-site fire behavior is expected to be similar to that modeled for the site. Wildfire behavior is expected to be of moderate intensity during extreme, Santa Ana weather conditions with maximum sustained wind speeds of 56 mph and low fuel moistures. Wildfire in the project vicinity is expected to be relatively short in duration as vegetative fuels are consumed rapidly. As such, there would not be a sustained source of heat and or flame associated with site-adjacent wildland fuels.

Further, the project site's fuels would be mowed to low growing ground cover in the developed portion of the project site. The post-project fuel modification areas would provide a significant reduction in the potential for fire ignition as well as the flame length, spread rate, and intensity of fires should ignition occur. The developed portion of the project site may be compared to a fuel break once completed. Adjacent native and undisturbed fuels may readily carry fire, especially during portions of the year where vegetation moisture content falls and warm temperatures, low humidity and high winds become common. The developed portion of the site will be largely free of combustible vegetation with only a ground cover of maintained vegetation adjacent to the SVC facility. Flying embers from off-site fire may inundate the project site during wind-driven fire events. The modified fuel areas and construction type and materials for all project features will resist ignition from ember showers. Ignition of the ground cover could result in a fast moving, but lower intensity fire that burns in a patchy manner on the site due to the highly compartmentalized fuel modification around the perimeter of the SVC development footprint.

Modeling Inputs:

Summer Weather - Onshore Flow (RUN 3 & 4):
1h Moisture: 2%
10h Moisture: 4%
100h Moisture: 6%
Live Herbaceous Moisture: 50%
Live Woody Moisture: 80%
20-ft Wind Speed: 18 mph
Wind Adjustment Factor: 0.6
Slope Steepness: 5-20%

Peak Weather - Offshore/Santa Ana Condition (RUN 1& 2):
1h Moisture: 1%
10h Moisture: 2%
100h Moisture: 4%
Live Herbaceous Moisture: 30%
Live Woody Moisture: 50%
20-ft Wind Speed: 56 mph
Wind Adjustment Factor: 0.6
Slope Steepness: 3-20%

RUN 1

Run 1
Fuel Model: Chamise-Bigberry manzanita, (Gs2, Sh5)
Flame Length: 63.7 feet
Fireline Intensity: 47,368 Btu/ft/s
Spread Rate: 14.3 mph

RUN 4

Run 4
Fuel Model: Oak Woodlands & Chamise-Bigberry manzanita, (Gs2, Sh5)
Flame Length: 10.6 to 26.2 feet
Fireline Intensity: 956 to 6,883 Btu/ft/s
Spread Rate: 1.2 to 2.4 mph

RUN 2

Run 2
Fuel Model: Oak Woodlands & Chamise-Bigberry manzanita, (Gs2, Sh5)
Flame Length: 30.2 to 63.6 feet
Fireline Intensity: 9,392 to 47,294 Btu/ft/s
Spread Rate: 9.6 to 14.3 mph

RUN 3

Run 3
Fuel Model: Oak Woodlands & Chamise-Bigberry manzanita, (Gs2, Sh5)
Flame Length: 10.6 to 26.2 feet
Fireline Intensity: 956 to 6,883 Btu/ft/s
Spread Rate: 1.2 to 2.4 mph

0 500 1,000 Feet

Proposed Site Boundary

SOURCE: Bing Maps, 2015

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FIGURE 7
Fire BehavePlus Analysis Map

Suncrest Dynamic Reactive Power Support Project FPP

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3 ANALYSIS OF PROJECT EFFECTS

3.1 Adequate Emergency Services

3.1.1 Emergency Response

The Proposed Project is located within the SDCFA responsibility area. Emergency response for the Project would be provided, initially, by the SDCFA Decanso Fire Station, which is staffed with CAL FIRE firefighter/paramedics via Schedule A contract with SDCFA. The Descanso Fire Station is located at 9718 River Road. The Descanso Station is approximately 6.5 miles to the most remote portion of the SVC facility with a calculated travel time of approximately 11.7 minutes[3].

Response to the Proposed Project from nearby fire stations will be within the acceptable time frame as designated in the County General Plan. The Project site is west of the boundary of the Central Mountain Subregional Plan, but within several hundred feet of that Plan's coverage area. The Central Mountain Subregional Plan was developed in conjunction with the San Diego County General Plan (County of San Diego 2011). The Proposed Project is located within lands that are zoned as Agricultural Use – Limited Agricultural Use Regulations (A70) and Agricultural Use – General Agricultural Use Regulations (A72), and lands that are designated as RL-80. Based on this category, maximum travel time is greater than 20 minutes. The intent of the 20 minute travel time is that very-low rural densities mitigate the risk associated with wildfires by reducing the number of people potentially exposed to wildfire hazard. The Project would include the adjusted equivalent of one person (see Section 4.1.1.1), roughly the same as one dwelling unit population, on the entire 6-acre site. Response from Descanso Fire Station is calculated at approximately 11 minutes. Therefore, the project complies with the General Plan's intent of the RL80 land use category for response travel time from nearby fire stations. A Fire Service Facility Availability Form is included in Appendix C (to be provided later on)).

Additional County Fire Resources

Within the unincorporated region's emergency services system, fire and emergency medical services are also provided by Fire Protection Districts (FPD), County Service Areas (CSA) and CALFIRE. Collectively, there are over 2,800 firefighters responsible for protecting the San Diego region from fire. Generally, each agency is responsible for structural fire protection and

[3] Travel distances were derived from Google Earth road data and driving on the access roads to fire stations from Proposed Project site while travel times were calculated applying the nationally recognized Insurance Services Office (ISO) Public Protection Classification Program's Response Time Standard formula (T=0.65 + 1.7 D, where T= time and D = distance). The ISO response travel time formula discounts speed for intersections, vehicle deceleration and acceleration, and does not include turnout time.

wildland fire protection within their area of responsibility. However, mutual and automatic aid agreements enable non-lead fire agencies to respond to fire emergencies outside their district boundaries. Interdependencies that exist among the region's fire protection agencies are primarily voluntary as no local governmental agency can exert authority over another.

The next due in will be the SDCFA Pine Valley Fire Station, (Station 44), which is approcimately 9.5 miles from the site and is staffed with CAL FIRE firefighter/paramedics via Schedule A contract with SDCFA. Response time from the fire station is approximately 15 to 20 minutes.

Additional resources could also come from the Alpine Fire Protection District's (AFPD) Fire Station 17. The fire station is located at 1364 Tavern Road in Alpine and it is approximately 14 miles from the Proposed Project's entrance. It is a full-time station staffed 24/7 by career firefighters. Response time from the AFPD Fire Station is calculated at approximately 24 minutes.

Private Fire Brigade

NextEra Energy will contract with a private fire industrial brigade (Capstone Fire & Safety Management, or similar) to conduct operations on electrical-related fires within the facility. The contract will be executed prior to the project beginning construction at the site. The contract will be in place for the duration of the project's lifespan and will provide technical expertise for responding to fires in an energized facility.

Emergency Services

Mercy is the contracted ambulance service provider for the Proposed Project area. The Mercy ambulance is in the Alpine area during the day and at night is housed in the Descanso Fire Station. In addition to Mercy, primary medical response is provided by area fire stations. The Proposed Project area is served by Sharp Grossmont Hospital, 5555 Grossmont Center Drive, La Mesa, located approximately 25 miles west (SWCA 2015a).

3.1.1.1 Emergency Service Level

The project does not propose any full-time personnel on site. This on-site worker population will vary, not be consistent, and therefore, does not fit into typical models to calculate projected call volume. During the 9-month construction period, the typical number of workers and visitors on site will be approximately 40 to 50 (or less) persons per day. The peak number of workers on a single day will be approximately 64. As a conservative assumption, the total number of unique construction workers over the entire construction period will be approximately 120. Visitors will include NEET West management, engineering consultants, government inspectors, and construction monitors, who will visit the site intermittently.

During operation, there will be a monthly inspection of the SVC, an inspection of the transmission line every 6 to 8 months, and periodic maintenance of the equipment. None of these activities will add full-time employees, and these activities will not result in new residents in the area. Each of these inspection and maintenance activities would be conducted by a small crew of, at most, two workers.

As a conservative comparison, this analysis uses two people on-site during daylight hours. There will be some variation throughout the year with a higher number of persons during the construction phase, but this will be short term. Therefore, the 24-hour equivalency for two people during a workshift would be ½ that number since staff would not be on site after dark/overnight. Using San Diego County fire agencies' estimate of 82 annual calls per 1,000 population, the project's estimated one daylight only on-site personnel, would generate up to 0.08 calls per year (approximately 1 call every 10 years). The type of call would be expected to be medical-related. These estimates are likely overly conservative because County statistics represent calls from dense urban areas where medical and fire related calls are much higher than would be anticipated from the Project. The existing fire and emergency medical response in the area can absorb this low number of calls.

3.1.1.2 Response Personnel Training

Studies (Grant 2010 and others) indicate that for some types of energy-producing facilities' fire data is lacking. This is true for SVC facilities, but it is clear that electrical fires can occur, when at energized facilities. The same studies evaluated what measures provide the best results for improving response capabilities and firefighter safety. Among the types of measures that provide the most benefit are firefighter training, proper labeling, firefighter familiarizing, and extreme caution during fire response. To that end, this FPP requires the Project to implement the following measures:

- Conduct training sessions with local fire station personnel;
- Provide a Technical Report identifying project specific firefighting issues;
- Create a customized video training CD with SDCFA and CALFIRE input that will be provided to local fire agencies for refresher training and training new firefighters who may rotate into potentially responding stations;
- Create consistent and clear labeling and placarding warnings on all electrical equipment; and
- Provide system technical contact information for reliably available key personnel who can assist responding firefighters with technical aspects of the Project

3.2 Fire Safety Requirements For Proposed Project

3.2.1 Fire and Maintenance Access Roads for SVC Facility

Primary access to the Proposed Project site for both construction and operations would be along Bell Bluff Truck Trail, which is an existing, private 30-foot wide paved road. Bell Bluff Truck Trail provides access to the area and the SDG&E Suncrest Substation from Japatul Valley Road located approximately 1.8 miles to the east of the Proposed Project site. Japatul Valley Road connects with Interstate 8 to the north.

Two entrances for emergency ingress/egress would be provided for the site off of Bell Bluff Truck Trail. These entrances would be controlled by 20-foot wide security gates. Secondary access is not necessary for this project since it would not include a significant increase in the number of people beyond a threshold that could impact the ability to evacuate those people while providing suitable ingress for emergency personnel. This project, once operational, will include an average of two people or fewer on site and will include no overnight accommodations, so no staff will be sleeping at the site.

Fire Access Roads (Internal)

The new access route will include construction of a paved turning apron, a graveled access drive, internal circulation route, and associated improvements. Access off of Bell Bluff Truck Trail to the SVC facility will occur along two, new access driveways. The turning aprons immediately off Bell Bluff Truck Trail will be designed to accommodate large construction and haul vehicles and will be paved. Permanent access to the proposed SVC area will be immediately off Bell Bluff Truck Trail via two new access driveways. The new access drives will entail construction of two 95-foot-long by 20-foot-wide graveled access road and paved turning aprons off Bell Bluff Truck Trail. SVC access driveways would be constructed to a minimum width of 20 feet improved designed, constructed, and maintained to support the imposed loads of fire apparatus (not less than 50,000 lbs.) and would be provided with an approved surface (6 inches of gravel) so as to provide all-weather driving capabilities. The SVC access drive will occur prior to construction of the SVC.

Deadends

Road distance thresholds specified under Section 503.1.3 of the Consolidated Fire Code restrict maximum dead end road lengths for varying parcel size. The project is zoned RL80 with a minimum allowable parcel size of 80 acres. Parcels of this size are allowed a maximum dead-end road length of 5,280 feet according to Section 503.1.3. The distance from Japatul Valley Road where there exists the opportunity to egress in two separate directions, to the entrance of the

Project is approximately 10,204 feet (1.9 miles), however, the Proposed Project's circulatory driveways/roadways will include opportunities for fire engine turn-around. Further, the intent of the dead end road length requirements is for evacuation of civilians from a wildfire emergency as well as fire department access. The Project includes a very low average number of on-site staff so that evacuation during an emergency would not impede fire access.

Vertical Clearance

Minimum vertical clearance of 13 feet 6 inches will be maintained for the Project's Fire Access Road (outside the project's perimeter fence) from the driving surface.

Grade

Road grades will not exceed 10%, complying with the Consolidated Fire Code for the proposed decomposed granite aggregate road surface. If during construction it is realized that any road surface may exceed 10%, appropriate mitigations will be provided including providing paved surface for those stretches over 10%.

Surface

The non-load-bearing surface material of the perimeter fire access roads would consist of an all-weather surface (6 inches of gravel over compacted soil) capable of supporting 75,000 pounds as required by County Fire Code.

Gates

The double swing gates at the entrances to this project shall be equipped with an approved emergency key-operated switch overriding all function commands and opening the gates or a fire accessible padlock. The gates have a measured opening of 22 feet and will be installed in compliance with Section 503.5 and 503.6 of the CCFC. The gate will be set back from Bell Bluff Truck Trail 90 feet or more on both site driveways, exceeding the 30 feet setback required by the Fire Code. The site will be completely fenced with a chain link (7-foot) fence.

3.2.2 Identification

Identification of roads and structures will comply with CCFC, Section 505. Additionally, an illuminated sign at the Project entrance will be provided that clearly indicates entire site de-energizing disconnect switch identification and location. Lighting for the sign will be provided by a motion sensor-activation so the light is not on all night, every night. Additionally, the sign lettering will be reflective and the sign locate where vehicle headlights may provide adequate illumination.

3.2.3 De-Energizing (Project Shut-off)

The SVC is connected to the electrical grid by a radial 'line' feed. Isolation of this line will electrically isolate the site. However, permission granting access to the site can only be from NEET West authorized personnel since electrical dangers 'charged capacitors' still exist after site isolation. To support 'project electrical shut-off' an appropriate site access protocol will be created and communicated, this will include typical routine site meetings with SDCFA during the operational phase. In addition, project contacts will be provided to the fire authority so a person with project equipment knowledge can be contacted to assist responding firefighters.'

3.2.4 Transmission Line

The transmission line will consist of an underground alignment. The proposed transmission line will occur along Bell Bluff Truck Trail within the 30- foot wide paved portion of the road within the curbs.

3.3 Water

Potential water supplies include primarily non-potable and recycled water sources. In an effort to minimize the use of potable water in drought conditions, a recycled water source has been identified at Padre Dam Municipal Water District's (PDMWD) Water Recycling Facility (PDMWD 2015), located 19 miles to the west of the Proposed Project for construction phase water. A water services agreement is currently being negotiated with PDMWD. NEET West is also coordinating with the current owner of the SVC property to provide an on-site water source in the event that reclaimed water sources are unavailable prior to construction. An on-site source would reduce the number of truck trips required to and from the site to deliver water. Existing PVC piping is already in place between the property owner's storage ponds and a water tank at the SVC site as the water is currently being used by SDG&E for restoration purposes.

This water will be obtained from a nearby water source and/or trucked in, as described above. Because the SVC and transmission line are electrical, equipment fires, should they occur, will be managed with chemical extinguishers or other non-water methods. Vegetation fires will be addressed with trucked in water or with emergency firefighting water reserves in the water tank next to the SVC location or the 300,000 gallon water tank on SDG&E property next to the Suncrest Substation. A 10,000 gallon water storage tank will be situated to the southwest of the northernmost access driveway and accessible by fire engines. The tank shall comply with NFPA 22, Private Fire Protection Water Tanks. The capacity of the water tank at the SVC facility will be based upon the demand for hand lines, plus a reasonable allocation for water supply for Fire Engines to generate firefighting foam for 15 minutes at an application density of 0.16 gpm/sq ft from a hose line using a 3% Aqueous Film-Forming Foam (AFFF) concentrate, for use on an oil fire in transformer containment. A conceptual estimate at this point, prior to detailed design, is

250 gpm for 15 minutes (3,750 gallons of water) plus 112.5 gallons of foam concentrate for oil firefighting. The actual amount of stored water is to be determined upon detailed design of the SVC facility. A procedure for ongoing inspection, maintenance and tank filling will be in place. The tanks and fire engine connections shall be located on the side of the fire access road(s). The width of the road at the water tank locations shall be at least 18 feet (travel width) plus an additional 10-foot width, for a distance of 50 feet, to allow for fire engine to park and connect to the tank, while leaving the road open. The tanks shall be labeled "Fire Water: 10,000 gallons" using reflective paint. Final location of the tanks and total number of gallons will be approved by the SDCFA based on a tank location drawing to be submitted by the Project applicant. Drawings shall show tank location, road, and shall include the tank standard drawing and notes.

If the secondary source of water is used, i.e., from the ponds of the current owner of the SVC property, that source will also not change the ability of the water suppliers identified to serve their customers, or substantially deplete local or regional groundwater supplies. The ponds are fed by rainwater, and SDG&E successfully used the same source during construction of the Sunrise Powerlink. For comparison, the ponds have an annual availability of 40 acre-feet per year, and during the two year Sunrise Powerlink construction period, SDG&E used 32 acre-feet per year. The Proposed Project's need during construction will be 8 acre-feet over less than one year.

For the above reasons, the Proposed Project's operational impact with respect to water facilities and overall effect on water supplies will be less than significant.

3.4 Operation and Maintenance

The Proposed Project will be remotely operated and monitored from NEET West's Lone Star control center in Austin, Texas. NEET West anticipates using similar substation monitoring, control and data acquisition architecture as used for its other power delivery assets, including the use of standard monitoring, control, protection equipment, use of circuit breakers and other line relay protection equipment. The Proposed Project will be monitored and operated via an Energy Management Systems (EMS) with redundant servers and telecommunications to two data centers. The project facilities will be dual scanned from both data centers and redundant ICCP (Inter-Control Center Communications Protocol or IEC 60870-6/TASE.2) servers will exchange SCADA data with CAISO and the neighboring transmission operator entities. The EMS will include displays and alarm processing to ensure transmission operations has real-time situational awareness. The EMS support personnel will perform daily checks of the applications and hardware to ensure they are in proper working order. The EMS system will also be maintained to ensure compliance with NERC Critical Infrastructure Protection Standard requirements. Any site anomalies will be communicated to the NextEra local high voltage technicians. NextEra local high voltage technicians will manage and undertake site corrective actions.

A maintenance plan will be created in accordance with the equipment vendors' directives, industry practice, NEET West's internal guidelines and regulatory requirements. The plan will be in compliance with the CAISO Transmission Control Agreement and Maintenance Practices Procedure and approved by the CAISO before the start of commercial operation.

In general, monthly inspections will be performed on the SVC to inspect each item of the equipment and check that no obvious abnormalities exist to the extent possible without taking the SVC out of service. Annually, it is anticipated, the facility will be taken out of service to perform more invasive checks and maintenance on the SVC main components. Inspection and maintenance will be performed by a one to two person crew of NextEra local high voltage technicians and personnel provided by equipment vendor.

3.5 Security Lighting

Lighting would be designed to provide security lighting and general nighttime lighting for O&M personnel, as may be required from time to time. Lighting will be installed at the SVC and will conform to National Electric Safety Code (NESC) requirements and County of San Diego Light Pollution Code Section 59.101 et seq. Lighting would be shielded and directed downward to minimize any effects to the surrounding area, and would be used only on an as-needed basis.

The on-site SVC would include lighting inside the site to allow for safety inspections or maintenance that may be required during the evening hours. Automatic Photo-sensor controlled lighting will be provided at a level sufficient to provide safe entry, and exit to the SVC site and Control Building. Lighting would also be provided next to the entrance door to the Control Building and mounted at the entrance gates to allow for safe entry. Since maintenance activities are not anticipated to be completed during the evening hours, manually controlled lighting will be provided to create safe working conditions at the SVC when required.

3.6 Security Fencing

The SVC site would be fenced along the entire property boundary for security with fencing that meets NESC requirements for protective arrangements in electric supply stations. Fencing will be 7 feet in height with a secure gate that is accessible by NEET West staff. The fencing would include a pedestrian access on the south side for use by responding fire personnel. The fence would be constructed with anti-climbing material(s). Signage in Spanish and English for electrical safety would be placed along the perimeter of the project site, warning the public of the high voltage and the need to keep out. Signage would also be placed within the project site where appropriate.

Some localized security-related lighting, on-site security personnel, and/or remotely monitored alarm system will be required during construction and/or operation. Site security will be monitored by CCTV and intruder detection systems. Oversight of the security status will be monitored by NextEra 24/7 Corporate Security Central Station personnel.

3.7 Defensible Space and Vegetation Management

The Proposed Project will be provided defensible space by a perimeter FMZ buffer the will include at least 84 feet of modified natural fuels in all directions from site equipment and up to 144 feet (Figure 8), by removing or maintaining them to a height of no more than 6 inches. The entire site within the perimeter fencing will be maintained free of vegetation. No off-site clearing is required or authorized, as fuel modification can be accommodated on site. Combustible vegetation within the Proposed Project area shall be limited to approved species. None of the plants on the prohibited plant list (Appendix E) shall be allowed on site.

Prescribed Defensible Space (site-wide fuel management zones) will be maintained on at least an annual basis or more often, as needed, by the Project owner. Planting used in the defensible space will consist of low-growing ground cover selected from the SDCFA desirable plant list. A potential plant mix for the fuel modification areas is included as Attachment F. The planting list

and spacing will be reviewed and approved by the SDCFA Fire Marshal and included on submitted Landscape Plans.

3.7.1 Fuel Modification

Project fuel modification will include one zone (opposed to multiple zones) consisting of areas of no fuel within the project's fenced area, retention basins with non-irrigated, low growing ground cover, or areas of other maintained fuels. Because this site will utilize non-combustible construction and the equipment will be of metal or concrete materials, the proposed fuel modification areas will provide adequate setback for the potential short duration wildfire that may be realized in the adjacent wildland fuels.

A minimum 84 foot wide fuel modification area up to 144 feet wide, will be provided for the project including the entire facility inside the perimeter fence and the off-site wildland fuels to the north, south, and west. To the east, a vertical retaining wall ranging between 4 and approximately 15 feet tall will occur at the facility boundary. The facility will be below the natural off-site grade. The wall will provide vertical separation between fuels and the facility and is considered adequate with no need for additional fuel modification to the west.

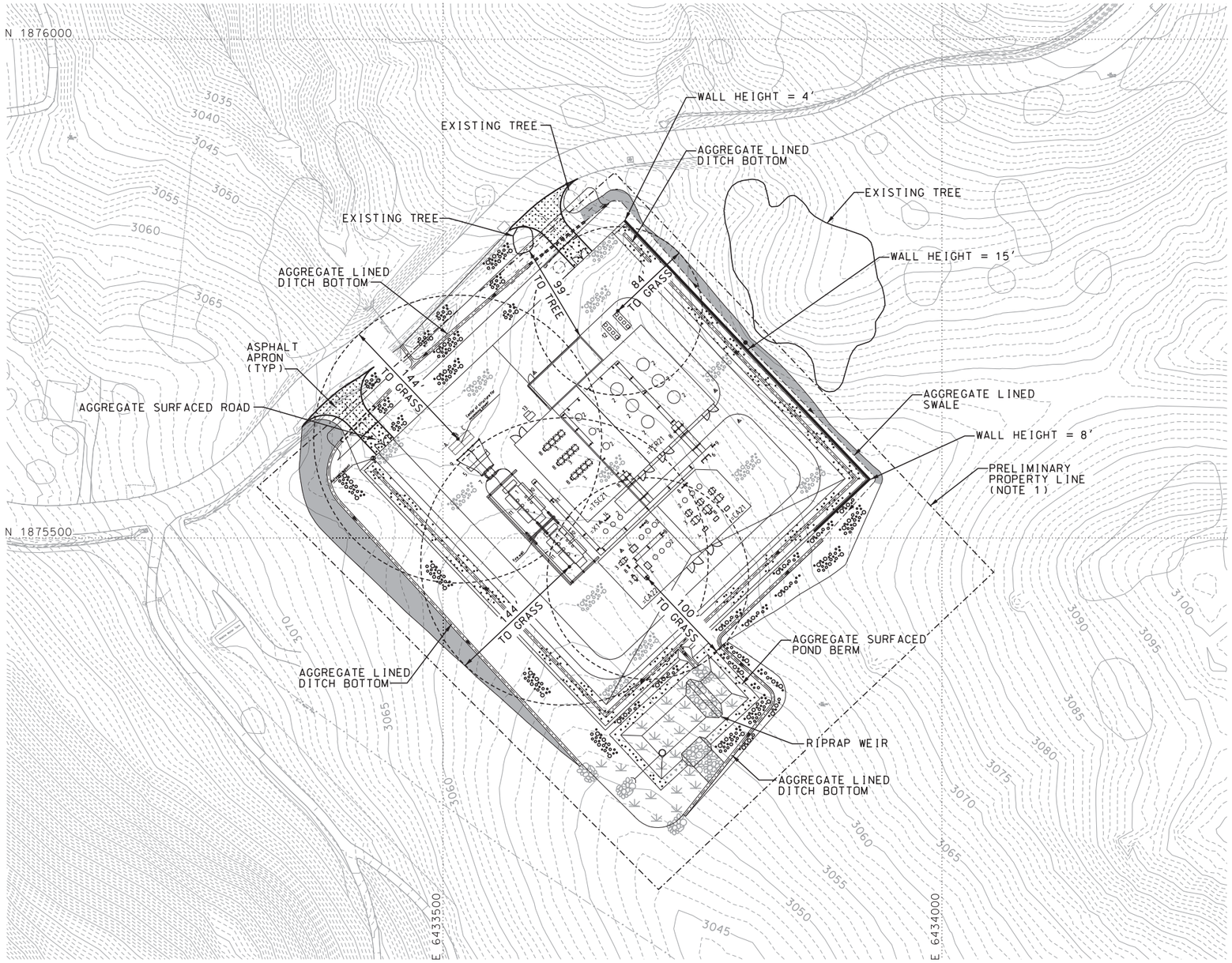
3.7.1.1 Fuel Modification Requirements

The following recommendations are provided for fuel modification, which are proposed to occur throughout the site from perimeter fence to SVC facility. There would be no fuel modification zone markers in the field.

Site Wide Low-Flammability Zone

The site's fuel modification is applicable throughout the developed portions of the site. The area where the site's equipment is located will be free of vegetation. As such, the existing vegetation will be removed The following specifications apply to the fuel modification area:

- Non-combustible surface (gravel, dirt, etc.) is acceptable, or:
- Cleared of all existing native vegetation and replanted with drought tolerant native species. This area will be maintained to 6 inches or less.
- Ground cover, less than 6 inches high in areas immediately outside perimeter fence
- Removal of all dead, dying, and dried (low fuel moisture) vegetation
- Refer to Appendix D for Prohibited Plants that will not be allowed on site. Trees are not recommended on the site or its perimeter
- Refer to Appendix E customized fuel modification plant list for potential plants that may be suitable for the site-wide low-flammability zone
- If the area is planted with native annual and perennial grasses they shall be allowed to grow and produce seed during the winter and spring. As grasses begin to cure (dry out), they will be cut to 6 inches or less in height.



NOTES:

1. PROPERTY LINE MUST BE CONFIRMED BY NEXTERA ENERGY.

LEGEND

- RIPRAP STABILIZED SIDESLOPE
- RIPRAP PAD
- SEEDING
- AGGREGATE SURFACING
- PAD AGGREGATE SURFACING
- ASPHALT PAVEMENT

NORTH

0 60 120 180

GRAPHIC SCALE

UNDERGROUND OR EMBEDDED UTILITIES MAY BE LOCATED WITHIN OR ADJACENT TO THE AREA IN WHICH EXCAVATION, DEMOLITION, FOUNDATION, OR MODIFICATION WORK IS TO BE PERFORMED.

REFERENCES RELATING TO THE UNDERGROUND OR EMBEDDED UTILITIES ARE PROVIDED TO ASSIST THE CONTRACTOR/INSTALLER IN THE FIELD LOCATING THOSE UTILITIES AND OTHER POSSIBLE UNDERGROUND OR EMBEDDED INTERFERENCES WITH THE WORK.

THE CONTRACTOR/INSTALLER SHALL EXERCISE DUE CAUTION DURING ALL EXCAVATION/FOUNDATION/DEMOLITION WORK.

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

PRELIMINARY
NOT FOR CONSTRUCTION

HOLD INFORMATION	
NO.	DESCRIPTION

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

RELEASE INFORMATION		
REV.	DATE	DESCRIPTION
0	02-12-2016	PRELIMINARY
1	03-21-2016	PRELIMINARY

ISSUE PURPOSE: PRELIMINARY
SPECIFICATION: S-7350
PROJECT NO.: 13139-018

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CALIFORNIA.

ENTER NAME
ENTER DATE

MY LICENSE RENEWAL DATE IS: ENTER DATE
PAGES OR SHEETS COVERED BY THIS SEAL:
THIS DOCUMENT ONLY.

CERT OF AUTHORIZATION (WHEN REQ'D)

CAD FILE NAME: CSK-100.DGN
PREPARED BY: C.FLAMINI
REVIEWED BY: M.BERNARDI-REIS
APPROVED BY: ---

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NEXTera ENERGY TRANSMISSION WEST

PROJECT

SUNCREST SVC
230 KV YARD
NEXTERA ENERGY
SAN DIEGO, CALIFORNIA

DRAWING TITLE

MINIMUM DISTANCES TO VEGETATION

DRAWING NUMBER	REVISION
CSK-100	1
SHEET 1 OF 1	

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3.7.1.2 Other Vegetation Management

1. Electrical Transmission Line Vegetation Management

In addition to the Proposed Project site fuel modification requirements, the Proposed Project interconnection transmission line would require standard vegetation clearance for the 300-foot-long overhead span and riser pole. Overhead transmission line and transmission pole vegetation management is regulated by various codes and ordinances including the following regulations:

California Public Utilities Commission

GO 95: Rules for Overhead Electric Line Construction

GO 95 is the standard governing the design, construction, operation, and maintenance of overhead electric lines in California. It was adopted in 1941 and updated most recently in 2006.

GO 95 includes safety standards for overhead electric lines, including minimum distances for conductor spacing, minimum conductor ground clearance, standards for calculating maximum sag, and vegetation clearance requirements.

Vegetation clearance requirements of GO 95 are:

GO 95: Rule 35, Tree Trimming Criteria, defines minimum vegetation clearances around power lines.

Rule 35 guidelines specify, at the time of trimming require:

- 4 feet radial clearances are required for any conductor of a line operating at 2,400 volts or more, but less than 72,000 volts;
- 6 feet radial clearances are required for any conductor of a line operating at 72,000 volts or more, but less than 110,000 volts;
- 10 feet radial clearances are required for any conductor of a line operating at 110,000 volts or more, but less than 300,000 volts (this would apply to the project);
- 15 feet radial clearances are required for any conductor of a line operating at 300,000 volts or more.

CCR, Title 14 Section 1254

The firebreak clearances required by PRC § 4292 are applicable within an imaginary cylindrical space surrounding each pole or tower on which a switch, fuse, transformer or lightning arrester is attached and surrounding each dead-end or corner pole, unless such pole or tower is exempt from minimum clearance requirements by provisions of CCR, Title 14 Section 1255 or PRC § 4296.

The radius of the cylindroids is 10 feet measured horizontally from the outer circumference of the specified pole or tower with height equal to the distance from the intersection of the imaginary vertical exterior surface of the cylindroid with the ground to an intersection with a horizontal plane passing through the highest point at which a conductor is attached to such pole or tower. Flammable vegetation and materials located wholly or partially within the firebreak space shall be treated as follows:

- At ground level – remove flammable materials, including but not limited to, ground litter, duff and dead or desiccated vegetation that will propagate fire;
- From 0 to 8 feet above ground level – remove flammable trash, debris or other materials, grass, herbaceous and brush vegetation. All limbs and foliage of living trees shall be removed up to a height of 8 feet;
- From 8 feet to horizontal plane of highest point of conductor attachment – remove dead, diseased or dying limbs and foliage from living sound trees and any dead, diseased or dying trees in their entirety.

North American Electric Reliability Council (NERC)

The purpose of the NERC FAC-003, *Standard Application Guide for Transmission Vegetation Management*, is to improve the reliability of the electric transmission systems by preventing outages from vegetation located on transmission rights-of-way (ROW) and minimizing outages from vegetation located adjacent to ROW, maintaining clearances between transmission lines and vegetation on and along transmission ROW, and reporting vegetation related outages of the transmission systems to the respective Regional Reliability Organizations (RRO) and the NERC. This standard shall apply to all transmission lines operated at 200 kV and above and to any lower voltage lines designated by the RRO as critical to the reliability of the electric system in the region.

2. Pre-Construction Vegetation Management

- Perimeter Vegetation Management Zones must be implemented prior to commencement of construction utilizing combustible materials.
- Fuel modification must be maintained on the perimeter throughout construction .

3. Undesirable Plants

Certain plants are considered to be undesirable in the landscape due to characteristics that make them highly flammable. These characteristics can be physical or chemical.

The plants included in the Prohibited Plant List (Appendix D) are unacceptable from a fire safety standpoint, and shall not be planted on the site. The area retained outside of the Project footprint in the western portion of the project that includes terrain not desirable for grading

includes non-native pine and eucalyptus trees as well as undesirable native plant species. These trees and flammable plants shall be removed and any subsequent sprouting or volunteering of trees or undesirable plant materials will be removed on an annual basis.

3.7.1.3 Fuel Modification Area Vegetation Maintenance

All fuel modification area vegetation management shall be completed annually by May 15 of each year and more often as needed for fire safety, as determined by the SDCFA. Project applicant or current owner shall be responsible for all vegetation management throughout the facility and Project site, in compliance with the requirements detailed herein. The Project applicant or current owner shall be responsible for ensuring long-term funding and ongoing compliance with all provisions of this FPP, including vegetation planting, fuel modification, vegetation management, and maintenance requirements throughout the Project site.

Fuel modification maintenance work may be provided by mowing, trimming, or other methods that result in the desired low-fuel conditions detailed herein.

As a further means of ensuring the fuel modification area is maintained per this FPP, the Project owner shall obtain an inspection and report from a SDCFA-authorized Wildland Fire Safety Inspector by June 1st of each year, certifying that vegetation management activities throughout the project site have been performed pursuant to this plan. This effort further ensures vegetation maintenance and compliance with no impact on the SDCFA.

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4 MITIGATION MEASURES AND DESIGN CONSIDERATIONS

As presented in this FPP, the Proposed Project provides customized measures that address the identified potential fire hazards on the site. The measures are independently established, but will work together to result in reduced fire threat and heightened fire protection. Figure 9 provides a Site Fire Safety Plan indicating the locations of important site safety features including roads, an on-site water storage tank, battery storage containers, inverters, and fuel modification areas. The provided measures include both required and Project-volunteered items, as follows:

1. Fuel Modification throughout the Project site from boundaries inward with restrictions on plant species, heights, densities, and locations. Implementation of vegetation management standards for electrical transmission line/interconnect to Suncrest substation.
2. Provide a technical report indicating special precautions for firefighting response (Appendix F).
3. Two, 20-foot wide access entrance driveways.
4. Participation in a CFD or a similar Developer Agreement, for funding firefighting and emergency medical resources, the details of which will be determined in the project Fire Service Agreement.
5. Project funded annual fuel modification inspections to ensure compliance with this FPP.
6. Motion sensor illuminated (and/or reflective) signage at main entrance with electrical grid disconnect and isolation information and identification.
7. Ability of first responders to de-energize the project's non-panel components from one location and a project contact who can assist responding firefighters with equipment knowledge.
8. Training program for local fire agencies.
9. Preparation of a construction fire prevention plan for this project to be implemented by all contractors working on this project.
10. Portable carbon dioxide (CO_2) fire extinguishers mounted at strategic locations approved by SDCFA.
11. One 10,000-gallon water tank adjacent northeast entrance to facility.
12. Committed on-going maintenance of all facility components for the life of the project
13. Consistent placarding and labeling of all components for fire safety/response

Additionally, the following Applicant Proposed Measures (APM) in Table 5 relating to hazards and hazardous materials (HAZ) include measures that are already required by existing regulations and/or requirements, or are standard practices that will minimize or prevent any potentially hazards.

Table 5
Applicant Proposed Measures for Hazards and Hazardous Materials

APM No.	Description
	Hazards and Hazardous Materials
APM HAZ-1	**Hazardous Materials and Waste Management Plan (HMWMP).** A HMWMP will be prepared and implemented for the Proposed Project. Construction will not begin until the plan is complete. The plan will be prepared in accordance with relevant state and federal guidelines and regulations (e.g., Cal/OSHA). • The plan will include the following information related to hazardous materials and waste, as applicable: • A list of hazardous materials present on-site during construction and operation to be updated as needed along with product Safety Data Sheets and other information regarding storage, application, transportation, and disposal requirements; • A Hazardous Materials Communication (i.e., HAZCOM) Plan; • Assignments and responsibilities of Proposed Project Health and Safety roles; • Standards for any secondary containment and countermeasures that will be required for hazardous materials; • Spill response procedures based on product and quantity. The procedures will include materials to be used, location of such materials within the Proposed Project area, and disposal protocols; and • Protocols for the management, testing, reporting, and disposal of potentially contaminated soils or groundwater observed or discovered during construction. This will include termination of work within the area of suspected contamination sampling by an OSHA trained individual, and testing at a certified laboratory. A copy of the plan will be provided to the CPUC for recordkeeping prior to the start of construction. Plan updates will be made and submitted as needed if construction activities change whereas the existing plan does not adequately address the Proposed Project.
APM HAZ-2	**Environmental and Hazardous Materials Safety and Management Plans.** Environmental and hazardous materials safety and management plans will be developed for the Proposed Project. This may include but is not limited to the preparation of a Hazardous Materials Business Plan, Spill-Response Plan, 90-day temporary storage and disposal facility permit, and a Spill Prevention Control and Countermeasure Plan (i.e., if the Proposed Project will result in storage of over 1,320 gallons of oil at any one location).
APM HAZ-3	**Weed Control Plan.** A Proposed Project-specific weed control plan will be prepared and implemented. for controlling the introduction and distribution of weeds during construction. The plan will include cleaning of tires and surfaces of all trucks and construction equipment prior to commencing work in off- road areas, using rocks/grates at the Proposed Project entry points to physically dislodge seeds, using certified weed-free mulch for stabilizing areas of disturbed soil, utilizing on-site soil to the maximum extent practicable for fill.
APM HAZ-4	**Construction Fire Prevention Plan (CFPP).** A CFPP will be prepared and implemented for the Proposed Project. The CFPP 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. The Plan will be developed in coordination with the SDCFA and CALFIRE at a minimum of 45 days prior to construction activities associated with this Proposed Project. .

Table 5
Applicant Proposed Measures for Hazards and Hazardous Materials

APM No.	Description
Hazards and Hazardous Materials	
APM HAZ-5	Remove hazards from work area. The removal of hazards (i.e., fuels) from the work area will reduce the severity of construction- and maintenance-related ignitions that escape initial containment efforts by minimizing fuel loads. This will reduce the potential impact to communities and natural resources in the event of a project construction- or maintenance-related ignition.
APM HAZ-6	Establish and maintain adequate equipment clearances. Establishing and maintaining adequate clearances from electrical equipment, such as the riser pole structure or SVC transformer components, will reduce the risk of vegetation contact with the 300-foot overhead conductor and provide a defensible space around the SVC site. Maintenance of vegetation will be in accordance with CPUC General Order No. 95, Section 3, Rule 35, Vegetation Management.
APM HAZ-7	**Fire Safe Working Conditions and Best Management Practices**. The following measures will be implemented during construction and operation to reduce the potential for ignitions and minimize fire related hazards: • All work vehicles will be required to carry fire suppression equipment, including but not limited to a fire extinguisher and shovel. Workers will be trained in the use of equipment for incipient stage fire suppression. • Smoking will be confined to vehicles or approved smoking areas where fire suppression equipment and appropriate disposal facilities are present. All smoking materials will be disposed of in appropriate disposal bins. • All on-road vehicle parking will be restricted to paved or graveled surfaces unless parking is required during an emergency or required for worker safety. • Require spark arrestors on all off-road equipment. • Restrict work activities during Red Flag Warnings issued by the National Weather Service to the extent possible. Where it is not possible to stop or restrict work activities due to safety or time sensitive activities, work activities will be limited to those needed to complete the current task and establish safe working conditions. During Red Flag Warnings a crew member will be assigned to fire watch for each separate and distinct active work area. • Weather and fire danger will be monitored on a daily basis. Fire suppression equipment such as backpack water pumps or water buffaloes will be kept on-site at a minimum of 50 feet from each separate and distinct active work area.
APM HAZ-8	Blasting Plan. If blasting is deemed necessary for the construction of Proposed Project components, NEET West shall conduct a pre-blast survey and prepare a Blasting Plan. A written report of the pre-blast survey and final blasting plan shall be provided to the appropriate regulatory agency and approved prior to any rock removal using explosives. In addition to any other requirements established by the appropriate regulatory agencies, the pre-blast survey and blasting plan shall meet the following conditions, as well as relevant noise impacts outlined in APM NOI-2, *Reduction of Blasting Impacts* in the Proposed Project's PEA: • The pre-blast survey shall be conducted for structures within a minimum radius of 1,000 feet from the identified blast site to be specified by NEET West. Notification that blasting will occur shall be provided to all owners of the identified structures to be surveyed prior to commencement of blasting. The pre- blast survey shall be included in the final blasting plan. • The final blasting plan shall address air-blast limits, ground vibrations, and maximum peak particle velocity for ground movement, including provisions to monitor and assess compliance with the air- blast, ground vibration, and peak particle velocity requirements. The blasting plan shall meet criteria established in Chapter 3 (Control of Adverse Effects) in the Blasting Guidance Manual of the U.S. Department of Interior Office of Surface Mining Reclamation and Enforcement.

Table 5
Applicant Proposed Measures for Hazards and Hazardous Materials

APM No.	Description
Hazards and Hazardous Materials	
	• The blasting plan shall outline the anticipated blasting procedures for the removal of rock material at the proposed SVC, riser pole and underground transmission line structures. The blasting procedures shall incorporate line control to full depth and controlled blasting techniques to create minimum breakage outside the line control and maximum rock fragmentation within the target area. Prior to blasting, all applicable regulatory measures shall be met. NEET West, or its subcontractor (as appropriate) shall keep a record of each blast for at least 1 year from the date of the last blast. • The blasting plan shall incorporate provisions to post signage along roads and trails within a minimum of 1000 feet of the identified blast site. Precautions such as fencing or taping will be incorporated that limit access to recreationalists and the general public.

Source: Proponent's Environmental Assessment (PEA) for Suncrest Dynamic Reactive Power Support Project prepared by SWCA Environmental Consultants August, 2015

DUDEK

SOURCE: Nextera, 2015; Bing Maps, 2015

FIGURE 9

Suncrest SVC Site Fire Safety Plan

Suncrest Dynamic Reactive Power Support Project FPP

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5 CONCLUSION

This FPP is submitted in support of an application for project entitlement of the Suncrest Dynamic Reactive Power Support Project. It is submitted as required in compliance with the County's conditions for FPP content. The requirements in this document meet the intent and purpose of the Code for fire safety, building design elements, fuel management/ modification, and landscaping requirements of San Diego County. This FPP documents required fire safety features required by applicable codes and recommends additional measures that will enhance the site's fire safety and reduce potential impacts to insignificant without lessening health, life, or fire safety.

Fire and Building Codes and other local, county, and state regulations in effect at the time of each Proposed Project phase's building permit application supersede these recommendations unless the FPP recommendation is more restrictive.

The Proposed Project provides fire access, off- and on-site water, structures built to ignition resistant standards, fuel modification and vegetation management, and measures for fire protection during construction. The site fuel modification is based on fire behavior modeling representing the fire environment and the type of fire that would be anticipated at this site. The fuel modification areas will be maintained and inspected annually by a SDCFA-approved, Project-funded wildland fire inspector, removing all dead and dying materials and maintaining appropriate horizontal and vertical spacing. In addition, plants that establish or are introduced to the fuel modification area that are not on the approved plant list will be removed.

In addition, the project will participate in a CFD or a similar Developer Agreement, which has provides resources in this portion of eastern San Diego County by requiring projects to provide funding toward fire department assets (stations, apparatus, equipment, personnel).

Ultimately, it is the intent of this FPP to guide, through code and mitigation requirements, the construction of the SVC facility and underground transmission line that is defensible from wildfire and, in turn, does not represent significant threat of ignition source for the adjacent native habitat. It must be noted that during extreme fire conditions, there are no guarantees that a given structure will not burn. Precautions and mitigating actions identified in this report are designed to reduce the likelihood that fire would impinge upon the proposed structures. There are no guarantees that fire will not occur in the area or that fire will not damage property or cause harm to persons or their property. Implementation of the required enhanced construction features provided by the applicable codes and the mitigating fuel modification requirements provided in this FPP will accomplish the goal of this FPP to assist firefighters in their efforts to defend these structures and reduce the risk associated with this project's WUI location.

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6 LIST OF PREPARERS

Project Manager:

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Fire Protection Planner; San Diego County California Environmental Quality Act Consultant List
Dudek

FPP Preparation and Fire Behavior Modeling:

Michael E. Scott
Urban Forester and Fire Protection Planner
Dudek

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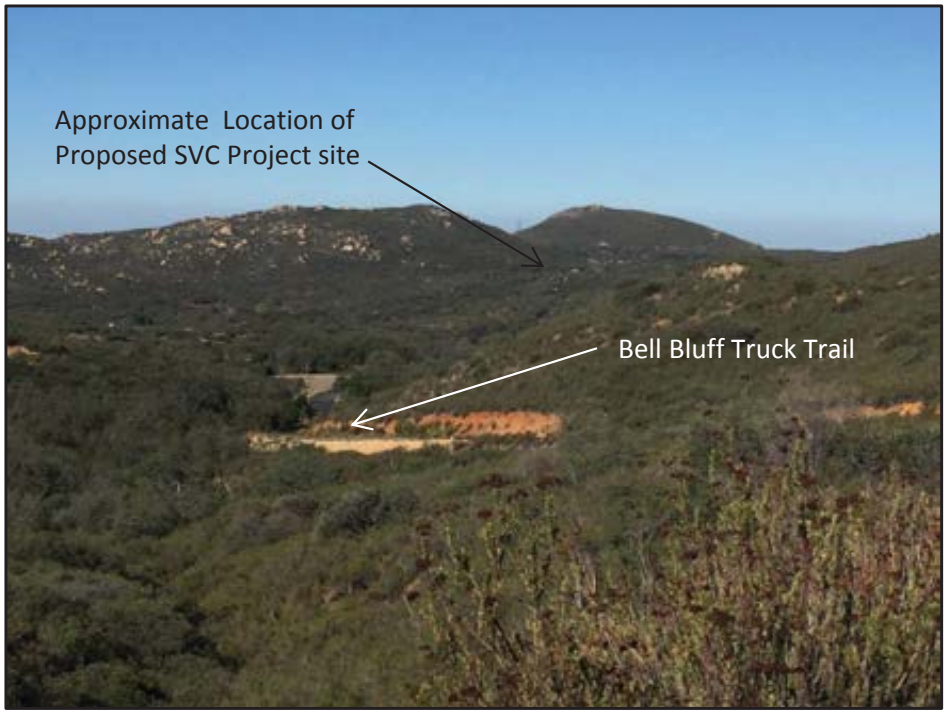
APPENDIX A

Site Photograph Log

Appendix A
Project Area Photographs



Photograph 1. Photograph shows view of terrain within the proximity of Proposed Project site. Bell Bluff Truck Trail , a 30-foot wide paved road, winds through the middle of the photograph.

Photograph 2. View of electric gate on Bell Bluff Truck Trail road before Proposed Project site and SDG&E Suncrest substation property.

Appendix A
Project Area Photographs (cont.)

Photograph 3. View looking west at existing conditions on Static Var Compensator (SVC) Proposed Project site.

Photo 3 Source: SWC Environmental Consultants Biological Resources Technical Report, August 2015

Appendix A
Project Area Photographs (cont.)

Photograph 4. View looking north towards Proposed Project area. Existing vegetation is chaparral- oak woodlands fuel types.

Photograph 5. View of Engelmann Oak-Coast Live Oak/ Poison Oak/ Grass Association (*Quercus engelmannii-Quercus agrifolia/ Toxicodendron diversilobum*/ Grass Association) at the Proposed Project. This vegetation type was modeled as a moderate load grass-shrub understory fuel model for the Project . Photograph source: SWCA Environmental Consultants Biological Resources Technical Report, August 2015.

Appendix A
Project Area Photographs (cont.)

Photograph 6. View of California Buckwheat Scrub (*Eriogonum fasciculatum* Association) at the Proposed Project site.

Photograph 7. View of Chamise Chaparral (*Adenostoma fasciculatum* Alliance) at the Proposed Project. This vegetation type was modeled as a high load shrub fuel model for the Project .

Photos 6 & 7 Source: SWC Environmental Consultants Biological Resources Technical Report, August 2015

Appendix A
Project Area Photographs (cont.)

Photograph 8. View of Bigberry Manzanita – Chamise Chaparral Association (*Arctostaphylos glauca – Adenostoma fasciculatum* Association) at the Proposed Project area.

Photograph 9. View looking west along Bell Bluff Truck Trail (Developed area).

Photos 8 & 9 Source: SWC Environmental Consultants Biological Resources Technical Report, August 2015

Appendix A
Project Area Photographs (cont.)

Photograph 10. Panoramic View looking west at existing conditions towards SVC Proposed Project site.

Photo 10 Source: SWC Environmental Consultants Biological Resources Technical Report, August 2015

Appendix A
Project Area Photographs (cont.)

Photograph 11. View looking east at existing conditions with Suncrest substation water tank in foreground.

Photo 11 Source: SWC Environmental Consultants Biological Resources Technical Report, August 2015

APPENDIX B

BehavePlus Fire Behavior Analysis

APPENDIX B
BehavePlus Fire Behavior Analysis

BEHAVEPLUS FIRE BEHAVIOR MODELING

Fire behavior modeling includes a high level of analysis and information detail to arrive at reasonably accurate representations of how wildfire would move through available fuels on a given site. Fire behavior calculations are based on site-specific fuel characteristics supported by fire science research that analyzes heat transfer related to specific fire behavior. To objectively predict flame lengths, spread rates, and fireline intensities, the BehavePlus 5.0.5 fire behavior modeling system was applied using predominant fuel characteristics, slope percentages, and extreme weather variables for the site.

Predicting wildland fire behavior is not an exact science. As such, the movement of a fire will likely never be fully predictable, especially considering the variations in weather and the limits of weather forecasting. Nevertheless, practiced and experienced judgment, coupled with a validated fire behavior modeling system, results in useful and accurate fire prevention planning information.

To be used effectively, the basic assumptions and limitations of BehavePlus must be understood.

- First, it must be realized that the fire model describes fire behavior only in the flaming front. The primary driving force in the predictive calculations is dead fuels less than one-quarter inch in diameter. These are the fine fuels that carry fire. Fuels greater than one inch have little effect while fuels greater than three inches have no effect on fire behavior.
- Second, the model bases calculations and descriptions on a wildfire spreading through surface fuels that are within six feet of the ground and contiguous to the ground. Surface fuels are often classified as grass, brush, litter, or slash.
- Third, the software assumes that weather and topography are uniform. However, because wildfires almost always burn under non-uniform conditions, length of projection period and choice of fuel model must be carefully considered to obtain useful predictions.
- Fourth, the BehavePlus fire behavior computer modeling system was not intended for determining sufficient fuel modification zone widths. However, it does provide the average length of the flames, which is a key element for determining “defensible space” distances for minimizing structure ignition.

Although BehavePlus has some limitations, it can still provide valuable fire behavior predictions which can be used as a tool in the decision-making process. In order to make reliable estimates of fire behavior, one must understand the relationship of fuels to the fire environment and be able to recognize the variations in these fuels. Natural fuels are made up of the various components of vegetation, both live and dead, that occur on a site. The type and quantity will depend upon the soil, climate, geographic features, and the fire history of the site. The major fuel groups of grass, shrub, trees, and slash are defined by their constituent types and quantities of litter and duff

layers, dead woody material, grasses and forbs, shrubs, regeneration, and trees. Fire behavior can be predicted largely by analyzing the characteristics of these fuels. Fire behavior is affected by seven principal fuel characteristics: fuel loading, size and shape, compactness, horizontal continuity, vertical arrangement, moisture content, and chemical properties.

The seven fuel characteristics help define the 13 standard fire behavior fuel models (Anderson 1982) and the more recent custom fuel models developed for southern California (Weise and Regelbrugge 1997). According to the model classifications, fuel models used in BehavePlus have been classified into four groups, based upon fuel loading (tons/acre), fuel height, and surface to volume ratio. Observation of the fuels in the field (on site) determines which fuel models should be applied in BehavePlus. The following describes the distribution of fuel models among general vegetation types for the standard 13 fuel models and the custom southern California fuel models:

- Grasses Fuel Models 1 through 3
- Brush Fuel Models 4 through 7, SCAL 14 through 18
- Timber Fuel Models 8 through 10
- Logging Slash Fuel Models 11 through 13

In addition, the aforementioned fuel characteristics were utilized in the recent development of 40 new fire behavior fuel models (Scott and Burgan 2005) developed for use in BehavePlus modeling efforts. These new models attempt to improve the accuracy of the standard 13 fuel models outside of severe fire season conditions, and to allow for the simulation of fuel treatment prescriptions. The following describes the distribution of fuel models among general vegetation types for the new 40 fuel models:

- Non-Burnable Models NB1, NB2, NB3, NB8, NB9
- Grass Models GR1 through GR9
- Grass-shrub Models GS1 through GS4
- Shrub Models SH1 through SH9
- Timber-understory Models TU1 through TU5
- Timber litter Models TL1 through TL9
- Slash blowdown Models SB1 through SB4

BEHAVEPLUS FIRE BEHAVIOR MODELING INPUTS

Vegetation/Fuels

To support the fire behavior modeling efforts conducted for this Fire Protection Plan, fuel models were identified for four key locations in order to represent multiple wildfire scenarios on or adjacent to the project site. While vegetation types other than the selected four are located on site, the selected areas represent the most likely wildfire threat for the proposed project. Table 1 summarizes fuel model assignments by modeling scenario.

Table 1
Fuel Model Assignments

Scenario	Vegetation Type	Fuel Model[1]
1	Bigberry Manzanita-Chamise chaparral	Sh2
2	Oak woodlands/Manzanita-chamise chaparral	Gs2/Sh5
3	Oak woodlands/Manzanita-chamise chaparral	Gs2/Sh5
4	Oak woodlands/Manzanita-chamise chaparral	Gs2/Sh5

Note:
1. Sh2= high load, dry climate shrub fuel model; Gs2= moderate load, dry climate grass-shrub understory fuel model

Weather

Fire behavior modeling conducted in support of this FPP utilized the guidelines and standards presented by the County of San Diego, Department of Planning and Land Use[1]. These guidelines identify acceptable fire weather inputs for extreme fire conditions during summer months and Santa Ana fire weather patterns. The County analyzed and processed fire weather from Remote Automated Weather Stations (RAWS) between April 15 to December 31 in order to represent the general limits of the fire season. Data provided by the County's analysis included temperature, relative humidity, and sustained wind speed and is categorized by weather zone, including Maritime, Coastal, Transitional, Interior, and Desert.

To evaluate potential fire behavior for the project site, Dudek utilized the BehavePlus (v. 5.0.5) fire behavior modeling software package to determine fuel moisture values and expected fire behavior for the site. The temperature, relative humidity, and wind speed data for the Interior[2] weather zone were utilized for this FPP based on the project location. Reference fuel moistures were calculated in BehavePlus and were based on site-specific topographic data inputs. Fire behavior for the site was calculated in four different locations using worst-case fuels and topography (steepest slopes). Two of the modeling scenarios analyzed potential fire behavior to

[1] County of San Diego Report Format and Content Requirements – Wildland Fire and Fire Protection (August 31, 2010). On-line at http://www.sdcounty.ca.gov/dplu/docs/Fire-Report-Format.pdf

[2] http://www.sangis.org

the east of the project site (Scenarios 1 and 2) during peak, Santa Ana fire weather conditions. The other two modeling scenarios (Scenarios 3 and 4) analyzed potential fire behavior in the western portion of the project site during Summer (on-shore) weather conditions. Table 2 summarizes the fuel moisture calculations utilized for this FPP.

Topography

The topography of the site is discussed in greater detail in the FPP. Slope is a measure of angle in degrees from horizontal and can be presented in units of degrees or percent. Slope is important in fire behavior analysis as it affects the exposure of fuel beds. Additionally, fire burning uphill spreads faster than those burning on flat terrain or down hill as uphill vegetation is pre-heated and dried in advance of the flaming front, resulting in faster ignition rates. Slope values for this site were measured from site topographic maps and are presented in units of percent. The modeling locations were located within undeveloped areas adjacent to the site with slope measurements ranging from 3 to 20 percent.

Scenarios to the east and southeast were selected based on the strong likelihood of fire approaching from both directions during a Santa Ana wind-driven fire event. Scenarios on the west and southwest were selected to evaluate fire behavior potential during a summer fire occurring during typical on-shore wind flow patterns. The fire behavior modeling input variables for the project site are presented in Table 2.

Table 2
BehavePlus Fire Behavior Modeling Inputs

Variable	Summer Weather (Onshore Flow)	Peak Weather (offshore/Santa Ana Condition)
Fire Scenario Runs	3 and 4	1 and 2
Fuel Model	Sh5, Gs2	Sh5, Gs2
1h Moisture	2%	1%
10h Moisture	4%	2%
100h Moisture	6%	4%
Live Herbaceous Moisture	50%	30%
Live Woody Moisture	80%	50%
20-ft Wind Speed	18 mph	56
Wind Adjustment Factor	0.6	0.6
Slope Steepness	5-20%	3-20%

BEHAVEPLUS FIRE BEHAVIOR MODELING RESULTS

Three fire behavior variables were selected as outputs from the BehavePlus analysis conducted for the project site, and include flame length (feet), rate of spread (mph), and fireline intensity (BTU/feet/second). The aforementioned fire behavior variables are an important component in understanding fire risk and fire agency response capabilities. Flame length, the length of the flame of a spreading surface fire within the flaming front, is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews, Bevins, and Seli 2004). It is a somewhat subjective and non-scientific measure of fire behavior, but is extremely important to fireline personnel in evaluating fireline intensity and is worth considering as an important fire variable (Rothermel 1983). Fireline intensity is a measure of heat output from the flaming front, and also affects the potential for a surface fire to transition to a crown fire. Fire spread rate represents the speed at which the fire progresses through surface fuels and is another important variable in initial attack and fire suppression efforts. The information in Table 3 presents an interpretation of these fire behavior variables as related to fire suppression efforts. The results of fire behavior modeling efforts are presented in Table 4. Additionally, identification of modeling run locations is presented graphically in Figure 6 of the FPP.

Table 3
Fire Suppression Interpretation

Flame Length (ft)	Fireline Intensity (Btu/ft/s)	Interpretations
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 to 8 feet	100-500 BTU/ft/s	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 to 11 feet	500-1000 BTU/ft/s	Fires may present serious control problems -- torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

Source: Andrews, Bevins, and Seli 2004

Table 4
BehavePlus Fire Behavior Modeling Results

Model Run	Fuel Model(s)	Flame Length (feet)	Fireline Intensity (Btu/ft/s)	Surface Rate of Spread (mph)
1	Sh5	63.7	47,368	14.3
2	Gs2, sh5	30.2 to 63.6	9,392 to 47,294	49.6 to 14.3
3	Gs2, Sh5	10.6 to 26.2	956 to 6,883	1.2 to 2.4
4	Gs2, Sh5	10.6 to 26.2	952 to 6,898	1.2 to 2.4

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APPENDIX C

Fire Facilities Availability Form
(To Be Provided)

APPENDIX D

Prohibited Plant List

APPENDIX D
Prohibited Plant List

Botanical Name	Common Name
Trees	
Abies species	Fir
Acacia species (numerous)	Acacia
Agonis juniperina	Juniper Myrtle
Araucaria species *(A. heterophylla, A. araucana, A. bidwillii)*	Araucaria (Norfolk Island Pine, Monkey Puzzle Tree, Bunya Bunya)
Callistemon species *(C. citrinus, C. rosea, C. viminalis)*	Bottlebrush (Lemon, Rose, Weeiping)
Calocedrus decurrens	Incense Cedar
Casuarina cunninghamiana	River She-Oak
Cedrus species *(C. atlantica, C. deodara)*	Cedar (Atlas, Deodar)
Chamaecyparis species (numerous)	False Cypress
Cinnamomum camphora	Camphor
Cryptomeria japonica	Japanese Cryptomeria
Cupressocyparis leylandii	Leyland Cypress
Cupressus species *(C. fobesii, C. glabra, C. sempervirens,)*	Cypress (Tecate, Arizona, Italian, others)
Eucalyptus species (numerous)	Eucalyptus
Juniperus species (numerous)	Juniper
Larix species *(L. decidua, L. occidentalis, L. kaempferi)*	Larch (European, Japanese, Western)
Leptospermum species *(L. laevigatum, L. petersonii)*	Tea Tree (Austrailian, Tea)
Lithocarpus densiflorus	Tan Oak
Melaleuca species *(M. linariifolia, M. nesophylla, M. quinqenervia)*	Melaleuca (Flaxleaf, Pink, Cajeput Tree)
Olea europea	Olive
Picea (numerous)	Spruce
Palm species (numerous)	Palm
Pinus species *(P. brutia, P. canariensis, P. eldarica, P. halopensis, P. pinea, P. radiate, numerous others)*	Pine (Calabrian, Canary Island, Mondell, Aleppo, Italian Stone, Monterey)
Platycladus orientalis	Oriental arborvitae
Podocarpus species *(P. gracilior, P. macrophyllus, P. latifolius)*	Fern Pine (Fern, Yew, Podocarpus)
Pseudotsuga menziesii	Douglas Fir
Schinus species (S. molle, S. terebenthifolius)	Pepper (California and Brazilian)
Tamarix species *(T. Africana, T. apylla, T. chinensis, T. parviflora)*	Tamarix (Tamarisk, Athel Tree, Salt Cedar, Tamarisk)
Taxodium species *(T. ascendens, T. distichum, T. mucronatum)*	Cypress (Pond, Bald, Monarch, Montezuma)
Taxus species *(T. baccata, T. brevifolia, T. cuspidata)*	Yew (English, Western, Japanese)
Thuja species (*T. occidentalis, T. plicata)*	Arborvitae/Red Cedar
Tsuga species *(T. heterophylla, T. mertensiana)*	Hemlock (Western, Mountain)
Groundcovers, Shrubs and Vines	
Acacia species	Acacia
Adenostoma fasciculatum	Chamise
Adenostoma sparsifolium	Red Shanks
Agropyron repens	Quackgrass
Anthemis cotula	Mayweed
Arbutus menziesii	Madrone
Arctostaphylos species	Manzanita

APPENDIX D (Continued)

Botanical Name	Common Name
Arundo donax	Giant Reed
Artemesia species *(A. abrotanium, A. absinthium, A. californica, A. caucasia, A. dracunulus, A. tridentate, A. pynocephala)*	Sagebrush (Southernwood, Wormwood, California, Silver, True tarrangon, Big, Sandhill)
Atriplex species (numerous)	Saltbush
Auena fatua	Wild Oat
Baccharis pilularis	Coyote Bush
Bambusa species	Bamboo
Bougainvillea species	Bougainvillea
Brassica species *(B. campestris, B. nigra, B. rapa)*	Mustard (Field, Black, Yellow)
Bromus rubens	Foxtail, Red brome
Cardera draba	Noary Cress
Carpobrotus species	Ice Plant, Hottentot Fig
Castanopsis chrysophylla	Giant Chinkapin
Cirsium vulgare	Wild Artichoke
Conyza bonariensis	Horseweed
Coprosma pumila	Prostrate Coprosma
Cortaderia selloana	Pampas Grass
Cytisus scoparius	Scotch Broom
Dodonea viscose	Hopseed Bush
Eriodyctyon californicum	Yerba Santa
Eriogonum species *(E. fasciculatum)*	Buckwheat (California)
Fremontodendron species	Flannel Bush
Hedera species *(H. canariensis, H. helix)*	Ivy (Algerian, English)
Heterotheca grandiflora	Telegraph Plant
Hordeum leporinum	Wild barley
Juniperus species	Juniper
Lactuca serriola	Prickly Lettuce
Larix species (numerous)	Larch
Larrea tridentata	Creosote bush
Lolium multiflorum	Ryegrass
Lonicera japonica	Japanese Honeysuckle
Mahonia species	Mahonia
Mimulus aurantiacus	Sticky Monkeyflower
Miscanthus species	Eulalie Grass
Muehlenbergia species	Deer Grass
Nicotania species *(N. bigelevil, N. glauca)*	Tobacco (Indian, Tree)
Pennisetum setaceum	Fountain Grass
Perronskia Atriplicifloria	Russian Sage
Phoradendrom species	Mistletoe
Pickeringia montana	Chaparral Pea
Rhus species *(R. diversiloba, R. laurina, R. lentii)*	Sumac (Poison oak, Laurel, Pink Flowering)
Ricinus communis	Castor Bean
Rosmarinus species	Rosemary

Botanical Name	Common Name
Salvia species (numerous)	Sage
Sacsola austails	Russian Thistle
Solanium Xantii	Purple Nightshade (toxic)
Sylibum marianum	Milk Thistle
Thuja species	Arborvitae
Urtica urens	Burning Nettle
Vinca major	Periwnkle
Rhus lentii	Pink Flowering Sumac

Notes:

1 For the purpose of using this list as a guide in selecting plant material, it is stipulated that all plant material will burn under various conditions.
2 The absence of a particular plant, shrub, groundcover, or tree, from this list does not necessarily mean it is fire resistive.
3 All vegetation used in Vegetation Management Zones and elsewhere in this development shall be subject to approval of the Fire Marshal.
4 Additional plants that are considered undesirable due to their invasiveness nature are detailed on the California Invasive Plant Council's Web site at www.cal-ipc.org/ip/inventory/index.php.
5 Landscape architects may submit proposals for use of certain vegetation on a project specific basis. They shall also submit justifications as to the fire resistivity of the proposed vegetation.

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APPENDIX E

Potential Plant List for Fuel Modification Areas

APPENDIX E
Potential Plant List for Fuel Modification Areas

Botanical Name	Common Name
Trees	
Achillea spp.	Yarrow – only species growing under 12 inches height
Baccharis pilularis	Dwarf coyote bush – only in areas over 50 feet from structures/CPV trackers
Cerastium tomentosum	Snow in Summer
Coprosma kirkii	Tequila sunrise – only prostrate varieties
Cotoneaster spp.	Cotoneaster – only species growing to less than 12 inches height
Dudleya brittonii	Britton's dudleya
Dudleya pulverulenta	Chalk lettuce
Eschscholzia californica	California poppy
Gazania spp.	Gazania
Helianthemum spp.	Sunrose*
L*asthenia californica glabrata*	California goldfields
Trifolium frageriferum Verbena	Strawberry clover
Trifolium frageriferum rigida	White clover
Viguiera laciniata	Goldeneye
Vinca minor	Dwarf periwinkle
Satureja douglasii	Yerba buena
Sisyrinchium bellum	Blue-eyed grass*
Sisyrinchium californicum	Yellow-eyed grass*

Notes:

1 For the purpose of using this list as a guide in selecting plant material, it is stipulated that all plant material will burn under various conditions.
2 The absence of a particular plant, shrub, groundcover, or tree, from this list does not necessarily mean it is not fire resistive.
3 All vegetation used in Vegetation Management Zones and elsewhere in this development shall be subject to approval of the Fire Marshal.
4 Plants that are considered undesirable due to their invasiveness nature should not be utilized in the fuel modification area plantings. The California Invasive Plant Council's Web site at www.cal-ipc.org/ip/inventory/index.php provides a listing of invasive plants.
5 Landscape architects may submit proposals for use of certain vegetation not included on this list. They shall also submit justifications as to the fire resistivity of the proposed vegetation.

* Project area is outside preferred Zone.

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APPENDIX F

Technical Report

Suncrest Dynamic Reactive Power Support Project
Static Var Compensator (SVC) Facility
Technical Report

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

JUNE 2016

Printed on 30% post-consumer recycled material.

Suncrest Dynamic Reactive Power Support Project
Static Var Compensator (SVC) Facility
Technical Report

TABLE OF CONTENTS

FIGURE

TABLES

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1 INTRODUCTION

The safety of fire fighters and other emergency first responder personnel depends on understanding and properly handling potential hazards associated with energized facilities through adequate training and preparation. This Technical Report provides basic facility information for responding firefighters. It is important that firefighters who may respond to this or any SVC facility understand the potential risks associated with their electricity producing components and what strategies, tools and equipment, and precautions are required for safely responding to emergencies. This Technical Report summarizes project features and readers should refer to the Proposed Project's Project Environmental Assessment (PEA) and Fire Protection Plan (Dudek 2015) for additional information.

The Suncrest Dynamic Reactive Power Support Project (the Proposed Project) proposes to install a Static Var Compensator (SVC) facility and 230 kV single circuit underground transmission line (underground transmission line). The Proposed Project would support the development of renewable generation to the Suncrest area in compliance with California's Renewable Portfolio Standard.

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2 BACKGROUND

2.1 Project Location

The Proposed Project is located on privately owned lands in the south central portion of San Diego County, approximately 33 miles east of the Pacific Coast. The Proposed Project is located approximately 3.8 miles southwest of the community of Descanso and 3.4 miles southeast of the community of Alpine. The Proposed Project will be constructed immediately south of Bell Bluff Truck Trail within an approximately six-acre portion of Assessor's Parcel Number (APN) 523-040-080. The project site lies within a portion of the northwest quarter of Section 3 of Township 16 South, Range 3 East, on the U.S. Geographical Survey (USGS), 7.5 minute, Viejas Mountain, California quadrangle map.

2.2 Proposed Project

The Proposed Project involves two primary components: the SVC facility and the 230 kV single circuit underground transmission line. The proposed SVC is an approximately 112,000-square-foot facility that would produce and consume reactive power and interconnect with the 230 kV bus of the existing San Diego Gas and Electric (SDG&E) Suncrest Substation through the proposed underground transmission line, which is approximately 1.0 mile in length. The proposed transmission line will be installed underground within polyvinyl chloride (PVC) conduits in a concrete-encased duct bank system beneath an existing paved, private road known as Bell Bluff Truck Trail. At the western terminus of the approximately 1-mile-long underground transmission line, the conductors would surface at a riser pole structure where they would transition to a 300-foot-long overhead transmission line span and terminate into the existing Suncrest Substation's 230 kV bus.

The Proposed Project would include the following primary components:

- A new SVC facility with a rated real power output of 0 MW, and a nominal terminal voltage of 230 kV;
- Two new access driveways to facilitate construction, operation, and maintenance of the SVC;
- A new approximately 1-mile 230 kV single-circuit underground electrical transmission line within a concrete-encased electrical duct bank between the SVC and the Suncrest Substation 230 kV bus;

- A fiber optic cable within the same underground duct bank as the 230 kV cable to provide communications for line relaying, the Supervisory Control and Data Acquisition (SCADA) communications and control system, and other devices as required;
- Up to five splice vaults to facilitate installation of the new underground cable and operation and maintenance of the transmission line;
- A 12 kV underground electrical distribution feed to the SVC; and,
- A riser pole approximately 85 to 95 feet in height north of the Suncrest Substation to transition the transmission line from underground to overhead to connect to the 230 kV bus.

The Proposed Project would be located entirely on private lands within unincorporated San Diego County, including the underground transmission line. Upon completion, the Proposed Project would be monitored off site through a supervisory control and data acquisition (SCADA) system.

As indicated in Figure 1 (The Site Fire Safety Plan), primary access to the Project site would be provided via Bell Bluff Truck Trail, a 30-foot wide improved access road, from Japatul Valley Road. Bell Bluff Truck Trail was recently paved as part of the Suncrest Substation project. Two additional points of emergency access would be provided for the SVC site off of Bell Bluff Truck Trail.

SDG&E would provide electrical service to the Proposed Project SVC facility. A 12 kV distribution electric line runs under Bell Bluff Truck Trail. It was built as part of the Sunrise Powerlink to serve the needs of the Suncrest Substation. The Proposed Project's 12 kV distribution feed will connect to this existing 12 kV service line under Bell Bluff Truck Trail. NEET West has requested this underground distribution service from SDG&E.

The Proposed Project would operate for an estimated 30 years or longer. Due to the establishment of the project infrastructure (both physical and contractual), the continued operation of the Proposed Project beyond the initial estimated term is very likely. At the end of its useful life, two alternative scenarios are possible: (1) retool the technology and continue its operation or (2) decommission and dismantle the facility.

DUDEK

SOURCE: Nextera, 2015; Bing Maps, 2015

FIGURE 1

Suncrest SVC Site Fire Safety Plan

Suncrest Dynamic Reactive Power Support Project

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3 DYNAMIC REACTIVE POWER SUPPORT TECHNOLOGY

3.1 Static Var Compensator (SVC) Facility

The Proposed Project would include installation of a Static Var Compensator (SVC) facility. The proposed SVC will keep transmission voltages within specified parameters, thereby reducing and preventing blackouts and brownouts and allowing increased deliverability of generated renewable energy. Construction of the SVC (e.g. limit of grading and associated site improvements based on current information) will occupy a total area of approximately 6.0 acres. Within the graded area, the SVC will be contained within a fenced area of up to approximately 2.58 acres. The final design, layout, and footprint of the SVC will be procured through a functional specification detailing capacity, performance, available site area, and other requirements. The final design will generally incorporate a number of common components including the following contained within the SVC fenced area:

- Lightning Shielding Masts
- 230 kV Circuit Breaker
- 230 kV Main Stringbus and Busbar
- 230 kV Group Operated Air Break Switch
- 230 kV Lightning Arresters
- 230 kV Potential Measurement Transformers
- Three Single Phase 230 kV Main Power Transformers (plus One Spare) Outdoor HVAC Equipment and Thyristor/Convertor Cooling Equipment
- Outdoor Capacitor Banks
- Outdoor Air Core Reactors
- Outdoor Medium Voltage Busbars
- Outdoor Medium Voltage Instrument/Auxiliary Transformers
- Outdoor Medium Voltage Surge Arresters
- Outdoor Medium Voltage Group Operated Air Break Switches
- Control House of approximately 2,500 square feet containing the following equipment:
    - Thyristor Valves and/or IGBT Convertors
    - Protective Relaying and Control Equipment

- SCADA Equipment
- Cooling Equipment
- AC/DC Auxiliary Power Equipment
- Spare Parts and Maintenance Tool Storage
- Miscellaneous Support Facilities

In addition to the electrical equipment, the SVC will include the following facilities or components for the site design:

- Signage and lighting;
- Access road improvements;
- A stormwater detention basin;
- A retaining wall, stormwater drainage ,and conveyance system;
- Chain link and barb wire security fencing approximately 7 feet in height with a secure gate accessible only by NEET West staff and emergency services personnel; and,
- Transformer oil containment basins designed to contain the oil volume of the transformers plus the 25 year 24-hour storm (See Transformer and Associated Equipment Section, below).

All facilities at the SVC, including the associated access drives and stormwater drainage and conveyance system, will occur within the property line of the approximately 6-acre parcel to be owned by NEET West. The tallest structures within the SVC will be the approximately 75-feet high lighting shielding masts.

3.2 Underground Transmission Line

An underground electric transmission line will connect the proposed SVC to the existing SDG&E Suncrest Substation. The proposed transmission line will be a new 230 kV single-circuit line composed of cross-linked polyethylene-insulated, solid-dielectric, copper or aluminum conductor cables. For a single-circuit line, there will be three separate cables installed within PVC conduits in a concrete-encased duct bank system. In addition to the 230 kV cables, a fourth spare PVC conduit will be installed in the duct bank to facilitate installation of a spare cable in the event of a failure occurs. There will be four smaller conduits for fiber optics to provide communications for line relaying, SCADA, and other devices as required. Dimensions of the overall duct bank are approximately 30 inches wide by 24 inches tall. Up to five underground

splice vaults will be installed along the transmission line alignment about every 900 feet to facilitate installation of the underground cables and to operate and maintain the transmission line following construction. The new transmission line will be approximately 1.0 mile in length and include a permanent Right-of-Way that will be approximately 12-feet-wide.

The proposed transmission line will be installed within the curbs of the existing Bell Bluff Truck Trail. The proposed underground transmission line will parallel an existing underground 12 kV distribution line owned by SDG&E, which is located on the south side of Bell Bluff Truck Trail, for approximately 3,400 feet. From the intersection of Bell Bluff Truck Trail and SDG&E's substation access road to the riser structure, NEET West anticipates having to cross a 12 kV distribution feeder (powering a communication site on the north side of Suncrest Substation), and the water pipe connecting SDG&E's water tank to the Suncrest Substation. Existing utilities and culverts within the roadway will be located and potholed prior to construction to ensure proper separation and avoidance by the proposed underground transmission line. Separation will be in accordance with CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communication Systems.

Final entry into the Suncrest Substation will be via an approximately 300-foot-long overhead span. The underground transmission line will be routed to a new self-supporting riser pole installed north of Bell Bluff Truck Trail outside of the Suncrest Substation. The riser pole at the end of the underground alignment where the line transitions to overhead will be located on the road shoulder just north of Bell Bluff Truck Trail. This riser pole will be between 85 and 95 feet tall and located just outside the pavement on the north side of Bell Bluff Truck Trail and approximately 250 feet southeast from the nearest, 142-foot-tall 230 kV Sunrise Powerlink transmission tower. The base of the riser pole has a diameter of approximately 7 feet and an approximate 15-foot radius of permanent clearance will be required around the riser pole, per GO-95 Rules.

3.3 Transformers and Associated Equipment

All major equipment (e.g. power transformers, power circuit breakers, control buildings, capacitors, and reactors) will be installed on concrete foundations. The maximum amount of oil required for the transformers at the SVC will be approximately 10,000 to 12,000 gallons for each of the four transformers. Secondary containment basins will be provided for each piece of equipment, including internal oil storage and transformers. The basins will be designed to retain 100 percent of the oil plus 24-hour 25-year storm in the transformer or storage area. Outdoor oil-insulated transformers will be separated from adjacent structures and from each other by firewalls for the purpose of limiting damage and potential spread of fire from a transformer

failure. Determination of the type of physical separation between transformers, control equipment, and building structures will be in accordance with NFPA 850, Section 5.1.4. *Outdoor Oil-Insulated Transformers*.

3.4 O&M Control System

Operation of the SVC facility would require monitoring and operation through a SCADA system. The Proposed Project will be remotely operated and monitored from NEET West's Lone Star control center in Austin, Texas. NEET West anticipates using similar substation monitoring, control and data acquisition architecture as used for its other power delivery assets, including the use of standard monitoring, control, protection equipment, use of circuit breakers and other line relay protection equipment. The Proposed Project will be monitored and operated via an Energy Management Systems (EMS) with redundant servers and telecommunications to two data centers. The project facilities will be dual scanned from both data centers and redundant ICCP (Inter-Control Center Communications Protocol or IEC 60870-6/TASE.2) servers will exchange SCADA data with California Independent System Operator and the neighboring transmission operator entities. The EMS will include displays and alarm processing to ensure transmission operations has real-time situational awareness. The EMS support personnel will perform daily checks of the applications and hardware to ensure they are in proper working order. The EMS system will also be maintained to ensure compliance with NERC Critical Infrastructure Protection Standard requirements. Any site anomalies will be communicated to the NextEra high voltage technicians. NextEra local high voltage technicians will manage and undertake site corrective actions.

3.5 Fire Access

It is not anticipated that fire personnel will need to drive into the SVC facility. However, permanent access to the proposed SVC area will be through two gated entrances and driveways immediately off Bell Bluff Truck Trail. The gates will be two feet wider than the access roads (22 feet over 20 feet wide roads) and will be set back over 90 feet from Bell Bluff Truck Trail. Each new access driveway will be comprised of a paved, turning apron off Bell Bluff Truck Trail onto a 95-foot long by 20-foot wide graveled access road. Both driveways would be constructed with an all-weather surface capable of supporting 75,000 pounds as required by County Fire Code.

3.6 Security Lighting

Lighting would be designed to provide security lighting and general nighttime lighting for Operations and Maintenance (O&M) personnel, as may be required from time to time. Lighting will be installed at the SVC and will conform to National Electric Safety Code (NESC) requirements and County of San Diego Light Pollution Code Section 59.101 et seq. Lighting would be shielded and directed downward to minimize any effects to the surrounding area, and would be used only on an as-needed basis.

The on-site SVC would include lighting inside the site to allow for safety inspections or maintenance and firefighter emergency operations that may be required during the evening hours. Automatic Photo-sensor controlled lighting will be provided at a level sufficient to provide safe entry, and exit to the SVC site and Control Building. Lighting would also be provided next to the entrance door to the Control Building and mounted at the entrance gates to allow for safe entry. Since maintenance activities are not anticipated to be completed during the evening hours, manually controlled lighting will be provided to create safe working conditions at the SVC when required.

3.7 Security Fencing

The SVC site would be fenced along the entire property boundary for security with fencing that meets NESC requirements for protective arrangements in electric supply stations. Fencing will be 7 feet in height with a secure gate that is accessible by NEET West staff. The fencing would include a pedestrian access on the south side for use by responding fire personnel, if necessary. The fence would be constructed with anti-climbing material(s). Signage in Spanish and English for electrical safety would be placed along the perimeter of the project site, warning the public of the high voltage and the need to keep out. Signage would also be placed within the project site where appropriate.

Some localized security-related lighting, on-site security personnel, and/or remotely monitored alarm system will be required during operation. Site security will be monitored by CCTV and intruder detection systems. Oversight of the security status will be monitored by NextEra 24/7 Corporate Security Central Station personnel.

3.8 Water Source

A 10,000 gallon, gravity based water tank will be situated to the southwest of the northernmost access driveway and accessible by fire engines. This tank will be maintained full via existing water source adjacent this site. PVC piping is already in place between the property owner's

storage ponds and a water tank at the SVC site as the water is currently being used by SDG&E for restoration purposes and an agreement to provide water for this site's 10,000 gallon tank will be in place prior to beginning construction. Water will be stored in an aboveground metal tank complying with the requirements of the SDCFA. The tank shall comply with NFPA 22, Private Fire Protection Water Tanks. The water capacity of the tank shall be at a minimum of 10,000 gallons. The capacity of the water tank at the SVC facility will be based upon the demand for hand lines, plus a reasonable allocation for water supply for Fire Engines to generate firefighting foam for 15 minutes at an application density of 0.16 gpm/sq ft from a hose line using a 3% Aqueous Film-Forming Foam (AFFF) concentrate, for use on an oil fire in transformer containment. A conceptual estimate at this point, prior to detailed design, is 250 gpm for 15 minutes (3,750 gallons of water) plus 112.5 gallons of foam concentrate for oil firefighting. The actual amount of stored water is to be determined upon detailed design of the SVC facility. A procedure for ongoing inspection, maintenance and tank filling of tanks will be in place. The tanks and fire engine connections shall be located on the side of the fire access road(s). The width of the road at the water tank locations shall be at least 18 feet (travel width) plus an additional 10-foot width, for a distance of 50 feet, to allow for fire engine to park and connect to the tank, while leaving the road open. The tanks shall be labeled "Fire Water: 10,000 gallons" using reflective paint. Final location of the tanks and total number of gallons will be approved by the SDCFA based on a tank location drawing to be submitted by the Project applicant. Drawings shall show tank location, road, and shall include the tank standard drawing and notes.

Because the SVC and transmission line are energized, equipment fires, should they occur, will primarily be managed with chemical extinguishers or other non-water methods unless a water fog is used to cool burning equipment. Vegetation fires will be addressed with trucked in water or with emergency firefighting water reserves in the 10,000 gallon water tank next to the SVC location or the 300,000 gallon water tank on SDG&E property next to the Suncrest Substation.

4 ANALYSIS

This Technical Report supplements the project's Fire Protection Plan (FPP) which evaluates and recommends actions for the Proposed Project to ensure it does not unnecessarily expose people or structures to fire risks and hazards. The FPP identifies and prioritizes the measures necessary to adequately mitigate those impacts. It considers the property location, topography, geology, combustible vegetation (fuel types), climatic conditions and fire history. It considers water supply, access, structure ignitability and fire resistive building materials, fire protection solar facilities and equipment, impacts to existing emergency services, defensible space and vegetation management.

The primary purpose of this Technical Report is to assist the fire authority/responding agencies in identify pre-suppression actions that would reduce risk directly associated with the SVC facility, actions that would protect and enhance the safety of fire suppression resources, and actions that could protect the SVC facility from ignition caused by other sources.

Emergency responders face unexpected challenges as new uses of alternative energy increase. These renewable power sources save on the use of conventional fuels such as petroleum and other fossil fuels, but they also introduce new or non-typical hazards that require varying firefighting strategies, procedures, and training.

The safety of firefighters and other emergency first responder personnel depends on understanding and properly handling these hazards through adequate training and preparation. San Diego County firefighters receive the necessary training required to respond to the various types of emergency incidents that they may face. Electrical firefighting and emergency response are not new to responding firefighters. There are existing electrical facilities that have led to firefighter training in best response strategies. This project will be similar to existing substation facilities and is not anticipated to result in unfamiliar technology requiring special training.

The goal of this report is to assemble core principle and best practice information for fire fighters, fire ground incident commanders, and other emergency first responders to assist in their decision making process for any emergencies at this site.

4.1 SVC Facility Effect on Fire Risk

The primary objective of this report is to identify the potential hazards resulting from the operation and maintenance of the SVC facility or underground transmission line as well as from natural conditions that could result in fire risk. Ignition risks are anticipated to drop considerably following the project's construction phase. Operation and maintenance activities

occur within a defined project footprint where the adjacent fuels have been removed or converted to fuel modification-consistent vegetation. Operation activities include conversion of electricity to a useable form and transmission of electricity to the grid. Maintenance activities will include repair, maintaining, and replacing equipment. Equipment failures may occur over time in different components of the SVC project. Among the type of equipment that may present ignition sources:

- **Transformers** – are subject to occasional failure, sending sparks, hot materials out in any direction; fire in a transformer may result in ignition of the oil therein
- **Capacitors** – may overheat, fail, and cause a spark, which may result in combustion of flammable materials, such as vegetation, if nearby
- **Electrical transmission lines** – energized lines may arch from adjacent vegetation (trees) or if tower/pole fails, may arch on the ground, causing ignition of vegetation
- **Vehicles** – heated exhausts in contact with vegetation may result in ignition
- **Hot Works Equipment** – all small hand tools either gas or electric powered that may result in sparks, flames, or excessive heat may result in vegetation ignition.

Among the potential hazards to responding firefighters are:

1. Firefighting crews should consider that all electrical components must always be considered energized. Crews should fight the fire as they would any other electrical fire and use a water spray for ordinary combustibles or vegetation located outside the SVC facility or dry chemical extinguishers (or other suppression technology for energized equipment) on any electrical wiring and any SVC component.
2. Depending on the level of damage to the SVC facility during a fire incident, the electrical connection to ground may have been lost and create an extremely hazardous situation, especially if pooling of water occurs.
3. The use of electrical conductive tools is hazardous, since the SVC facility components may be energized.
4. Care must be taken to avoid unnecessary contact with potentially energized SVC facility components until they can be isolated and confirmed de-energized.
5. Burning transformers and wire insulation may produce toxic vapors. Outdoor oil-insulated transformers will be installed on concrete foundations and separated from each other by firewalls for the purpose of limiting damage and potential spread of fire from a transformer failure. Firefighters should wear full personal protection equipment (PPE)

and Self Contained Breathing Apparatus (SCBA) due to the potential for toxic or hazardous inhalation that may be produced by these burning components. Crews should work upwind of the smoke plume, whenever possible.

6. Overhead transmission line contacting vegetation that could cause an ignition, especially when excessive electrical load demands cause line sag. This potential issue is not considered likely given the alignment of the underground transmission line will be located just outside the pavement on the north side of Bell Bluff Truck Trail. Road side vegetation along Bell Bluff Truck Trail will be thinned and kept cleaned of deadwood per County of San Diego standards. The base of the riser pole will also be permanently cleared for a 15-foot radius around the riser pole, per CPUC General Order No. 95, Section 3, Rule 35: Vegetation Management.
7. Firefighters should never cut the wiring in a SVC facility or transmission line. Specialized tools may be required for disconnecting the wiring. SVC electrical components should not be disassembled, damaged or removed by firefighters until all of the SVC facility's components are isolated or de-energized by a qualified NextEra high voltage technician. Firefighters should limit their activities to containment of the fire until it can be confirmed that the SVC facility is isolated or de-energized.
8. At any incident where electrical components are present, the Incident Command (IC) must designate a "Utilities Group" early to aid in locating and disabling all of the SVC facility components. This can greatly decrease the electric shock hazard to all crews operating on the fire ground. Firefighters must remember that all SVC components must be considered HOT.
9. At the conclusion of an incident, demobilization and termination efforts should be directed at leaving the property in the safest condition possible. An overall focused size-up and risk-benefit analysis should be conducted.
10. Along with a structural stability assessment, hazard identification and the marking of any potentially energized areas should be a priority. A qualified NextEra high voltage technician should be called to the incident to de-energize any SVC facility that has been compromised or creates a hazard. Transferring scene safety and security to an appropriate local, municipal authority may be an option if the fire department is unable to quickly secure the assistance of a qualified NextEra high voltage technician or electrician. All hazards should be appropriately marked or barricaded. The contact information for a NEET technician who will serve as the emergency contact will be provided to the local fire agencies prior to the project being brought on-line.

4.2 Fuels Management to Protect Facilities from other Sources

The Proposed Project will be provided defensible space by a perimeter FMZ buffer the will include at least 84 feet of modified natural fuels in all directions from site equipment and up to 144 feet (refer to Project Fire Protection Plan for details), by removing or maintaining them to a height of no more than 6 inches. The entire site within the perimeter fencing will be maintained free of vegetation. No off-site clearing is required or authorized, as fuel modification can be accommodated on site. Combustible vegetation within the Proposed Project area shall be limited to approved species. None of the plants on the prohibited plant list (Appendix E of the FPP) shall be allowed on site.

Prescribed Defensible Space (site-wide fuel management zones) will be maintained on at least an annual basis or more often, as needed, by the Project owner. Planting used in the defensible space will consist of low-growing ground cover selected from the SDCFA desirable plant list.

4.2.1 Fuel Modification

Project fuel modification will include one zone (opposed to multiple zones) consisting of areas of no fuel within the project's fenced area, retention basins with non-irrigated, low growing ground cover, or areas of other maintained fuels. Because this site will utilize non-combustible construction and the equipment will be of metal or concrete materials, the proposed fuel modification areas will provide adequate setback for the potential short duration wildfire that may be realized in the adjacent wildland fuels.

A minimum 84 foot wide fuel modification area up to 144 feet wide, will be provided for the project including the entire facility inside the perimeter fence and the off-site wildland fuels to the north, south, and west. To the east, a vertical retaining wall ranging between 4 and approximately 15 feet tall will occur at the facility boundary. The facility will be below the natural off-site grade. The wall will provide vertical separation between fuels and the facility and is considered adequate with no need for additional fuel modification to the west.

4.2.1.1 Fuel Modification Requirements

The following recommendations are provided for fuel modification, which are proposed to occur throughout the site from perimeter fence to SVC facility. There would be no fuel modification zone markers in the field.

Site Wide Low-Flammability Zone

The site's fuel modification is applicable throughout the developed portions of the site. The area where the site's equipment is located will be free of vegetation. As such, the existing vegetation will be removed. The following specifications apply to the fuel modification area:

- Non-combustible surface (gravel, dirt, etc.) is acceptable, or:
- Cleared of all existing native vegetation and replanted with drought tolerant native species. This area will be maintained to 6 inches or less.
- Ground cover, less than 6 inches high in areas immediately outside perimeter fence
- Removal of all dead, dying, and dried (low fuel moisture) vegetation
- Refer to Appendix D for Prohibited Plants that will not be allowed on site. Trees are not recommended on the site or its perimeter
- Refer to Appendix E customized fuel modification plant list for potential plants that may be suitable for the site-wide low-flammability zone
- If the area is planted with native annual and perennial grasses they shall be allowed to grow and produce seed during the winter and spring. As grasses begin to cure (dry out), they will be cut to 6 inches or less in height.

4.2.1.2 Fuel Modification Area Vegetation Maintenance

All fuel modification area vegetation management shall be completed annually by May 15 of each year and more often as needed for fire safety, as determined by the SDCFA. Project applicant or current owner shall be responsible for all vegetation management throughout the facility and Project site, in compliance with the requirements detailed herein. The Project applicant or current owner shall be responsible for ensuring long-term funding and ongoing compliance with all provisions of the FPP, including vegetation planting, fuel modification, vegetation management, and maintenance requirements throughout the Project site.

- Fuel modification maintenance work may be provided by mowing, trimming, or other methods that result in the desired low-fuel conditions detailed herein.
- As a further means of ensuring the fuel modification area is maintained per the FPP, the Project owner shall obtain an inspection and report from a SDCFA-authorized Wildland Fire Safety Inspector by June 1st of each year, certifying that vegetation management activities throughout the project site have been performed pursuant to that plan. This effort further ensures vegetation maintenance and compliance with no impact on the SDCFA.

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5 EFFECTS OF ELECTRICITY ON THE HUMAN BODY

5.1 Physiological Effects

Electricity flowing through the human body can shock, cause involuntary muscle reaction, paralyze muscles, burn tissues and organs, or kill. The typical effects of various electric currents flowing through the body on the average **150-lb male** and **115-lb female** body are given in Table B-1.

Burns. Although a current may not pass through vital organs or nerve centers, internal electrical burns can still occur. These burns, which are a result of heat generated by current flowing in tissues, can be either at the skin surface and/or in deeper layers (muscles, bones, etc.). Typically, tissues damaged from this type of electrical burn heal slowly.

Burns caused by electric arcs are similar to burns from high-temperature sources. The temperature of an electric arc, which is in the range of 4,000–35,000°F, can melt all known materials, vaporize metal in close proximity, and burn flesh and ignite clothing at distances up to 10 ft from the arc.

Table B-1
Effects of Electric Current on the Human Body (Ref. 1)

Effect/feeling	Direct current (mA)		Alternating current (mA) 60 Hz		Alternating current (mA) 10,000 Hz		Incident severity
	150 lb	*115 lb*	*150 lb*	*115 lb*	*150 lb*	*115 lb*	
Slight sensation	1	0.6	0.4	0.3	7	5	None
Perception threshold	5.2	3.5	1.1	0.7	12	8	None
Shock not painful	9	6	1.8	1.2	17	11	None
Shock painful	62	41	9	6	55	37	Spasm, indirect injury
Muscle clamps source	76	51	16	10.5	75	50	Possibly fatal
Respiratory arrest	170	109	30	19	180	95	Frequently fatal
≥ 0.03-s vent. fibril.	1300	870	1000	670	1100	740	Probably fatal
≥ 3-s vent. fibril.	500	370	100	67	500	340	Probably fatal
≥ 5-s vent. fibril.	375	250	75	50	375	250	Probably fatal
Cardiac arrest	—	—	4000	4000	—	—	Possibly fatal
Organs burn	—	—	5000	5000	—	—	Fatal if it is a vital organ

Delayed Effects. Damage to internal tissues may not be apparent immediately after contact with the current. Internal tissue swelling and edema are also possible.

Critical Path. The critical path of electricity through the body is through the chest cavity. At levels noted in Table A-1, current flowing from one hand to the other, from a hand to the opposite foot, or from the head to either foot will pass through the chest cavity paralyzing the respiratory or heart muscles, initiating ventricular fibrillation and/or burning vital organs.

5.2 Biological Effects of Electrical Hazards

Influential Variables. The effects of electric current on the human body can vary depending on the following:

1. Source characteristics (current, frequency, and voltage of all electric energy sources).
2. Body impedance and the current's pathway through the body.
3. How environmental conditions affect the body's contact resistance.
4. Duration of the contact.

Source Characteristics. An AC with a voltage potential greater than 550 V can puncture the skin and result in immediate contact with the inner body resistance. A 110-V shock may or may not result in a dangerous current, depending on the circuit path which may include the skin resistance. A shock greater than 600 V will always result in very dangerous current levels. The most severe result of an electrical shock is death.

Conditions for a serious (potentially lethal) shock across a critical path, such as the heart, are:

1. More than 30 V root mean square (rms), 42.4-V peak, or 60 V DC at a total impedance of less than 5000
2. 10 to 75 mA
3. More than 10 J

Conditions for a potentially lethal shock across the heart are:

1. More than 375 V at a total body impedance of less than 5000
2. More than 75 mA
3. More than 50 J

Frequency: The worst possible frequency for humans is 60 Hz, which is commonly used in utility power systems. Humans are about five times more sensitive to 60 Hz AC than to DC. At

60 Hz, humans are more than six times as sensitive to AC than at 5000 Hz—and the sensitivity appears to decrease still further as the frequency increases. Above 100–200 kHz, sensations change from tingling to warmth, although serious burns can occur from higher radio-frequency energy. At much higher frequencies (e.g., above 1 MHz), the body again becomes sensitive to the effects of an alternating electric current, and contact with a conductor is no longer necessary; energy is transferred to the body by means of electromagnetic radiation (EMR).

Body Impedance: Three components constitute body impedance: internal body resistance and the two skin resistances at the contact points with two surfaces of different voltage potential. One-hand (or single-point) body contact with electrical circuits or equipment will prevent a person from completing a circuit between two surfaces of different voltage potential. Table B-2 provides a listing of skin-contact resistances encountered under various conditions. It also shows the work area surfaces and wearing apparel effects on the total resistance from the electrical power source to ground. This table can be used to determine how electrical hazards could affect a worker in varying situations.

Table B-2
Human resistance (Q) for Various Skin-contact conditions.

Body contact condition	Dry (Ω)	Wet (Ω)
Finger touch	40,000–1,000,000	4,000–15,000
Hand holding wire	15,000–50,000	3000–5000
Finger-thumb grasp	10,000–30,000	2000–5000
Hand holding a pliers	5,000–10,000	1000–3000
Palm touch	3000–8000	1000–2000
Hand around 1.5-in. pipe or drill handle	1000–3000	500–1500
Two hands around 1.5-in. pipe	500–1500	250–750
Hand immersed	—	200–500
Foot immersed	—	100–300

Life-Threatening Effects. Charles F. Dalziel, Ralph H. Lee, and others have established the following criteria for the lethal effects of electric shock:

1. Currents in excess of a human's "let-go" current (≥16 mA at 60 Hz) passing through the chest can produce collapse, unconsciousness, asphyxia, and even death (see also Table B-1).
2. Currents (≥30 mA at 60 Hz) flowing through the nerve centers that control breathing can produce respiratory inhibition, which could last long after interruption of the current.

3. Cardiac arrest can be caused by a current greater than or equal to 1 A at 60 Hz flowing in the region of the heart.
4. Relatively high currents (0.25–1 A) can produce fatal damage to the central nervous system.
5. Currents greater than 5 A can produce deep body and organ burns, substantially raise body temperature, and cause immediate death.
6. Delayed reactions and even death can be caused by serious burns or other complications.

Source: Lawrence Livermore National Laboratory.

The complete document can be found at http://www.llnl.gov/es_and_h/hsm/doc_16.01/doc16-01.html

6 DETAILED RESPONSE RECOMMENDATIONS

Every emergency incident to which a fire department responds is unique. Despite the differences, however, there are common characteristics that allow fire service personnel to better understand the tasks that need to be performed and to prepare for their duties. This section provides a review of the common elements of most interest to fire fighters when handling emergencies involving electrical power systems.

SVC Systems Highest Concerns

1. Tripping/Slipping
2. Transformer Failure
3. Flame Spread
4. Inhalation Exposure
5. Electrical Shock

6.1 Energized System Firefighting

If the SVC components become engulfed in fire, appropriate care should be exercised in firefighting response, and it should be attacked similarly to any piece of electrically energized equipment. Normally this would involve shutting down the power and applying water in a fog pattern on combustible materials or utilizing a dry chemical or foam, but it is critical to be aware that these materials could be energized.

Even with known shutdown steps taken to isolate electrical current, fire fighters should always treat all wiring and solar power components as if they are electrically energized.

Care should be taken throughout fireground operations never to cut or damage any conduit or any electrical equipment, and they should be treated as energized at all times.

6.2 Respiratory Protection

Proper respiratory protection should be used during all fireground operations that involve a potentially hazardous atmosphere. Similarly, these protective measures apply during post-fire activities such as overhaul or fire investigations. Care should be taken during all fire ground operations to protect against respiratory exposure from products of combustion involving electrical or transformer systems. Under normal conditions the materials used for the SVC facility are relatively inert and safe, but they can become dangerous when exposed to fire. If

power components are involved in a fire, care should be taken to avoid exposure to the products of combustion due to the somewhat unusual materials involved. In addition to inhalation concerns, dermal exposure from system materials damaged by fire should also be handled with caution regardless of the type of power system.

Emergency responders are required to wear full respiratory protection (e.g., self-contained breathing apparatus) for any atmosphere that is possibly IDLH (immediately dangerous to life or health), and this should be the case when handling damaged equipment involved in fire unless proven otherwise

6.3 Firefighting Strategic Mode

Following an assessment of a fire related situation, the choice of a strategic mode should be made by the Incident Commander (IC) following local jurisdiction Emergency Operation Manuals, SOPs and guides that would normally be used for Electrical Hazards. Tactics, like strategy, should also be based upon normal standard operating procedures for responding to an emergency incident for an electrical transformer facility.

1. **Strategy -** When a fire incident occurs in the vicinity of a SVC facility, the following items must be considered when developing a strategy:
    a. Document fire conditions found on arrival – confirm fire location, type of fire, extents, potential threats
    b. Confirm whether a component of the SVC facility itself is burning or whether fire is confined to the surrounding vegetation
    c. Confirm whether anyone on-site is threatened by the fire
    d. Confirm whether aerial firefighting resources are being used or should be ordered for wildfire and know potential limitations of its use on/near SVC facility.
    e. Document any threatened exposures, including wild land areas
    f. Locate water and additional resources available (site includes one 10,000 gallon water tank with firefighting water (Figure 1).

    Once the IC has completed a size-up, the IC should determine the strategy and assign tasks to the fire suppression resources assigned to the incident. Due to the potential hazards associated with the SVC site, the IC must adjust the strategy and potentially rearrange the order of the tactics to deal specifically with the SVC facility technology. If the IC chooses an offensive strategy it needs to be supported as it would under other fire

operations with an emphasis on disabling all power sources to and from the site or remaining at a safe distance and limiting spread if energy is not confirmed disabled.

2. **Tactics -** Tactics will be based on the chosen strategy and Department SOPs:
   a. Components are always hot! The single most critical message of emergency response personnel is to always consider SVC facilities and all their components as electrically energized.
   b. Isolation of the inverters and disconnection of the facility from the main electrical panel will be an important task. Assistance from a NEET technician is key for disabling the facility and confirming that all of the hazards have been mitigated. An emergency response plan identifying all tasks and the parties responsible for providing the electrical isolation for emergency responders is required.
   c. Another priority will be preventing fire spread and isolating it to its area of origin. This task may be difficult during a vegetation fire adjacent the site, especially if aerial resources are being used. Ground resources should be removed from the site until the air attack has concluded.
   d. Dry chemical extinguishers should be used to contain or extinguish electrical fires. Water should be used to extinguish any ordinary combustibles near the facility, or if the volume of fire requires its use. If water is used, a 30º fog pattern from at least a 30 foot distance, at 100 psi is recommended.
   e. Full PPE must be used due to the potential toxic inhalation hazard if oils are burning. Fire crews should position themselves upwind and out of any toxic atmosphere.
   f. Ingress and egress will require that gates have an inside measurement of a minimum of 20 feet wide. The primary fire access will require a Knox Lock. Existing gates plus any future gates that may be installed on the access roads or fence lines must be equipped with an approved padlock, Knox key box (“Knox” padlock, or “Knox” weather resistant lock box, for use with a “Knox” sub-master key) or “Knox” box electronic access system.
   g. During the overall fire suppression and mop-up phases of an on-site fire, firefighters should avoid all potential electrical hazards until there is confirmation that the facility no longer poses an electric shock hazard. Firefighters must avoid inadvertently damaging SVC components with their tools.
   h. The IC will need the assistance from qualified NextEra high voltage technician to confirm that all of the hazards have been mitigated before the incident is terminated

and the scene is turned over to the owner or responsible party. The contact information for a NEET technician will be provided to the fire authority prior to project operation.

i. The tactical approach to a fire incident with electrical equipment must be stressed to all fire suppression personnel (i.e., stay clear).