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MEMORANDUM

To:	Renée Longman, California Energy Commission
From:	Compass Energy Storage LLC
Subject:	Compass Energy Storage Project – Update Regarding Selected Battery Storage Technology and Fire Protection
Date:	September 5, 2024
Attachment(s):	A Updated Section 2 Project Description
	B Updated Section 4.17 Wildfire and Fire Protection
	C Updated Appendix 4.17A Fire Technical Report

This memorandum and its attachments are provided for the Compass Energy Storage Project (Project) to update information regarding the battery energy storage technology that will be procured and installed for the Project. This memorandum and its attachments also provide additional detail about the selected battery energy storage technology's fire safety mechanisms.

The Project's Opt-In Application pursuant to Assembly Bill 205 was submitted to the California Energy Commission (CEC) on April 12, 2024. Since this time, the Applicant has further refined Project details and design, including the commitment to procure Tesla Megapack 2XL technology for the Project. The Opt-In Application provided to the CEC on April 12, 2024, discussed general battery energy storage fire safety mechanisms, such as a Fire Suppression System, or FSS, that is used in many battery storage technology types. Typically, a FSS system is composed of smoke detectors, gas detectors and aerosols, which serve the primary purpose of preventing fire spread in time should any open flame or gas signal appear in the battery system. The Tesla Megapack 2XL, or MP2XL, does not utilize this type of suppression mechanism due to its unique and improved safety design, and instead uses a built-in failsafe fire protection system to automatically shut down any affected battery storage components and prevent the spread of the fire to the other battery storage modules, that are compliant with National Fire Protection Association (NFPA) 855 and Underwriters Laboratories (UL) certified.

The Tesla Megapack 2XL also includes an explosion control system to mitigate the risk of an uncontrolled deflagration. The system includes 26 pressure-sensitive vents (overpressure vents) and 12 sparkers installed throughout the battery module bay designed to ignite flammable gases very early in a thermal runaway event before they accumulate within the enclosure and become an explosion hazard. The sparkers are installed at a variety of locations and heights throughout the battery module bay to ensure the flammable gases released during thermal runaway quickly meet an ignition source. The 26 overpressure vents are installed in the roof of the sealed battery module bay's IP66 enclosure and permit gases, products of combustion, and flames to safely exhaust through the roof during a thermal event. By designing this natural ventilation flow path, flammable gases are not permitted to accumulate within the MP2XL cabinet, reducing the risk of an explosion that could compromise the cabinet's integrity, push open the front doors, or expel projectiles from the cabinet. In addition, the ventilation path creates a controlled fire condition, should one occur, out the front and top of the MP2XL cabinet. By maintaining the cabinet's integrity, keeping all the doors shut during a fire event, reducing the risk of projectiles, and creating a controlled path for flames that exit the top of the MP2XL cabinet, the likelihood of a thermal event having an impact on life or safety of site personnel or first responders is reduced. In addition, by maintaining these features, the likelihood of a fire propagating to electrical equipment or other exposures is also reduced and can be designed for at the installation level (i.e., maintain clearances, emergency response plans, etc.).

The number and total area of overpressure vents is sized following the requirements of NFPA 68. They are designed to relieve with a safety factor of 2.5 times the enclosure's strength, including the front doors. Meaning, during an overpressure event inside the MP2XL cabinet, the overpressure vents will open when subjected to an overpressure of approximately 12 kilopascal (kPa) (250 pounds per square foot [psf]), well before the integrity of the enclosure itself becomes compromised at 30 kPa (626 psf) with a 2.5 times safety factor.

Tesla developed the overpressure vents and sparker system because the application of NFPA 68 or NFPA 69 was not suitable for the MP2XL cabinet given it does not have large volumes of open space, as is typical of BESS cabinets. This engineered approach is permitted by NFPA 855, Section 9.6.5.6.4, provided it is validated through large-scale, unit level fire testing, which Tesla has performed. During the UL 9540A unit level test, six cells were simultaneously forced into thermal runaway within a single battery module. This resulted in thermal runaway propagating to a seventh cell only. The failure of the seven cells did not result in any observations of explosion hazards, including but not limited to, observations of a deflagration, projectiles, flying debris, detonation, or other explosive discharge of gases. In addition, internal destructive unit level fire testing further demonstrated the functionality of the explosion control system. During this test, 48 cells were simultaneously failed within the same battery module (an extreme abuse condition). The sparker system ignited the flammable off-gases and an overpressure vent opened. This resulted in a controlled fire event. There were no observations of explosion hazards, such as projectiles, flying debris, detonation, or other explosive discharge of gases.

Additional detail on these prevention and mitigation systems are included with this memorandum and will be included in the hazard mitigation analysis and corresponding emergency response plan developed in cooperation with the Orange County Fire Authority prior to the commencement of construction.

Since the Project's battery storage technology has been further refined and selected, the following sections and appendices of the Opt-In Application have been updated to discuss fire safety mechanisms of the Tesla Megapack 2XL (see Attachments A through C).

- Section 2, Project Description, Subsection 2.2.1, Battery Energy Storage System (paragraph 4, page 2-3)
- Section 4.17, Wildfire and Fire Protection, Subsection 4.17.2.3.2, Wildfire Risk and Pollutant Containment in a Wildfire Event (paragraph 3, page 4.17-7)
- Appendix 4.17A, Fire Technical Report, Section 1.2, Project Description (pages 3 through 5), Section 3 Discussion subsection B (page 11), and Section 4, Recommendations (page 12).

Please do not hesitate to reach out to us if you have any questions or comments.

Attachment A

Updated Section 2 Project Description

2 Project Description

2.1 Overview and Location

The battery energy storage (BESS) project (Project) proposed by Compass Energy Storage LLC is a 250 MW, up to 1000 MWh facility composed of lithium-iron phosphate, or similar technology batteries (LFP), inverters, medium-voltage (MV) transformers, a switchyard, a collector substation, and other associated equipment to interconnect into the San Diego Gas and Electric (SDG&E) Trabuco to Capistrano 138 kilovolt (kV) transmission line (Point of Interconnection). The Project includes a switchyard to be owned and operated by SDG&E. The batteries will be installed in non-habitable steel cabinet-enclosures. The enclosures will have battery storage racks, with relay and communications systems for remote, automated monitoring and managing of the batteries. The BESS will also include a battery management system to control the charging/discharging of the batteries, along with temperature monitoring and control of individual battery cell temperature with an integrated cooling system. Batteries operate with direct current (DC) electricity, which must be converted to alternating current (AC) for compatibility with the existing electric grid. Power inverters to convert between AC and DC, along with transformers to step up the voltage, will be included as part of the Project. Electric energy will be transferred from the existing power grid to the Project batteries for storage and from the Project batteries to the power grid when additional electricity is needed.

Following construction, the Project will not create air emissions, will not require sanitary facilities, will generate minimal vehicle trips, and will only require water for landscape irrigation and to supply on-site fire hydrants5

The proposed Project consists of approximately 12.4 acres of an approximately 40.8-acre parcel in the City of San Juan Capistrano, California (City). The Project also includes approximately 1.6 acres of offsite components (access road). The Project site is located within the northern portion of the City, adjacent to Camino Capistrano with Interstate-5 located to the east. The Project site is utilized by the current owner, Saddleback Church, for ancillary activities and is adjacent to the Saddleback Church Rancho Capistrano to the north, mostly open space to the south, Oso Creek to the south and east, Metrolink Railroad and Interstate-5 to the east, and open space and residences outside of the City limits to the west. The SDG&E Trabuco to Capistrano 138 kV transmission line is located approximately 500 feet to the east and runs alongside the Metrolink Railroad tracks.

Upon commencement of construction, Compass Energy Storage LLC will be the owner of the battery project site and upon completion of construction, the SDG&E switchyard site will be deeded to SDG&E.

The Project site was selected given it is in an area of high energy demand near SDG&E facilities. The Project site is one of the few remaining suitable and available sites in Orange County with minimal topography and associated grading/civil improvements in immediate proximity to transmission with full capacity and deliverability --and where extensive off-site transmission upgrades are not required. The Project location requires minimal new facilities to interconnect into the SDG&E grid with only 500 feet of transmission improvements. The Project site is also located immediately adjacent to existing roadways that provides readily available access for construction and operations. The site is also located outside of sensitive biological habitat as the site has been mostly previously disturbed.

2.2 Project Components

The Project will include the development of an approximately 250 MW BESS and associated infrastructure. A BESS is comprised of stationary equipment that receives electrical energy and then utilizes batteries to store that energy to then supply electrical energy at a future time. Power released or captured by the proposed Project will be transferred to and from the SDG&E Trabuco to Capistrano 138kV transmission line via a loop-in generation transmission line that will interconnect to an SDG&E switchyard that will be constructed within the Project site. The Project will consist of LFP or similar technology batteries installed in racks and contained inside non-habitable enclosures; inverters; MV transformers; an SDG&E switchyard; a Project substation; and other associated equipment. The Project will include the following components:

- Battery Energy Storage System
- Power Inverters and Transformers
- Project Substation
- SDG&E Switchyard
- Telecommunication Facilities
- Perimeter Visual Screening and Security Walls
- Stormwater Detention Facilities
- Landscaping
- Access Road Improvements
- Site Access and Security
- Loop-In Transmission Line
- Fire Protection System
- Operations and Maintenance Area

These facilities will be remotely operated year-round and be available to receive or deliver electrical energy to the grid 24 hours a day and 365 days a year. After commissioning and during the operational life of the Project, qualified technicians would routinely inspect the battery energy storage system and conduct necessary maintenance to ensure safe operational readiness. If an issue arises, the system can remotely shut down and de-energize.

Project components are also described in the following subsections. Figure 2-1, Site Plan, shows the Project layout. Appendix 2A contains scale plan and elevation drawings depicting the relative size and location of all facilities. Table 2-1 summarizes the preliminary square footage of the major Project components.

Table 2-1. Preliminary Project Square Footage

Component	Area (square feet)
Battery enclosures, inverters, and transformer yard	321,900
Project substation	30,030
SDG&E switchyard	81,840
Access Road and Miscellaneous	138,000
Total	**571,770**

2.2.1 Battery Energy Storage System

The lithium-ion batteries (LFP) will be housed in racks similar to common computer server racks. The racks are typically made of aluminum, but sometimes may be composed of steel. The LFP technology is considered one of the safest, best understood, and most efficient methods of energy storage on the market. The proposed facility will use an LFP technology that has a long lifespan and boasts superior safety and stability characteristics. The battery racks will be designed and installed in accordance with the local seismic design requirements.

The battery racks will be housed in non-habitable enclosures. The BESS will be designed and installed in conformance with the nationally recognized National Fire Protection Association (NFPA) 855 Standard for the Installation of Stationary Energy Storage Systems, along with all applicable state and City fire protection requirements. The BESS development area will be connected with an improved access road that will meet OCFA requirements. Future augmentation area will be located within the BESS yard.

A Battery Management System (BMS) is used in conjunction with the energy storage system, which can monitor the battery voltage, current, temperature, managing energy absorption and release, thermal management, low voltage power supply, high voltage security monitoring, fault diagnosis and management, external communication with PCS and Emergency Management System (EMS), and ensure the stable operation of the energy storage system.

The Project will use battery storage systems that are compliant with National Fire Protection Association (NFPA) 855, that are Underwriters Laboratories (UL) certified, and that include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. A fire protection system is installed to automatically shut down any affected battery storage components and prevent the spread of the fire to the other battery storage modules.

~~Included in the BESS are the fire suppression system (FSS) and the heating, ventilation, and air conditioning (HVAC) system. The FSS system is composed of smoke detectors, gas detectors and aerosols, which serve the primary purpose of preventing fire spread in time should any open flame or gas signal appear in the battery system. The HVAC system is essentially liquid cooling, with the main function of maintaining the temperature of the battery system within the allowable operating temperature range. An auxiliary distribution box will also be included which provides auxiliary power for the whole control system and liquid cooling system~~. In addition, the site will include infra-red sensors and visual monitoring by the operations team as part of its Hazard Mitigation and Emergency Response program.

2.2.2 Power Inverters and Transformers

Compass Energy Storage LLC uses only industry-standard, nationally (and internationally) recognized equipment. The inverters are unattended, stand-alone units that operate in all conditions. They operate in both a charge mode and a discharge mode. They are UL listed for bi-directional use and are monitored and controlled remotely. There will be on-site disconnects in the case of an emergency or unscheduled maintenance. They are robust in their design and are designed to last more than 30 years with proper preventive maintenance, scheduled maintenance, and occasional major overhauls.

MV transformers and additional electrical equipment will be installed outside the BESS enclosure. Underground wires and cabling will run from the battery cable collection box to a concrete pad housing the inverter and transformer. From the MV transformer, cabling will be run to the Project substation. All outside electrical equipment

will be housed in the appropriate National Electrical Manufacturers Association (NEMA) rated enclosures and screened from view, to the extent possible, on all sides.

2.2.3 Project Substation

A Project substation will be installed that will include open rack, air insulated switch gear and the main power transformer to step up from 34.5 kV to 138 kV, as well as a pole to connect the Project substation to the SDG&E switchyard.

2.2.4 SDG&E Switchyard

An SDG&E switchyard will be installed adjacent to the Project substation that will include open rack, air insulated switch gear to deliver power to the nearby Trabuco to Capistrano 138kV transmission line. There will also be a Transmission Control Center within the switchyard area.

2.2.5 Telecommunication Facilities

The Project will include telecommunication facilities for communication with the SDG&E/CAISO facilities and to support remote Project operations monitoring. To provide for communication with SDG&E facilities, a fiber-optic cable will be used to connect the Project site switchyard with the SDG&E point of interconnection. Utility interconnection regulations require the installation of a second, separate, redundant fiber-optic cable. The redundant fiber-optic cable will also be installed within the Project footprint. For remote monitoring and operations communication, the Project will use local exchange carrier services, connecting to existing telecommunication fiber-optic lines owned and managed by local telecommunication providers.

2.2.6 Water Detention Structures

As discussed above, the proposed Project layout consists of access roads, substation area, and battery storage area. The batteries and other equipment will sit on top of concrete foundations and the remaining operational areas will have aggregate surfacing. The Project has been designed to meet regulatory standards and reduce potential for stormwater to be discharged off site in exceedance of existing conditions.

Stormwater runoff from the Project site currently outflows to a unchannelized section of Oso Creek. Once the Project is complete our site will drain to existing Orange County Flood Control District (OCFCD) storm drainpipes/outfalls which are located northeast of the Project site.

The onsite stormwater runoff from the Project will be detained in an underground storage chamber system located under and adjacent to the access roads, and is sized for the 100-year storm event. From here, the water will be pumped north to one of two existing OCFCD outfalls. The Project's onsite discharge pumped into the storm drains/outfalls will be incorporated into, and consistent with the OCFCD's National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Order No. R9-2013-0001, NPDES No. CAS0109266, as amended by Order No., R9-2015-0001) authorized by the San Diego RWQCB. The flows to these outfalls will not be increased from the existing peak flowrates.

With respect to offsite flows, based on the exiting topography, an area across 50.99 acres drains toward the Project site from the west. The proposed stormwater design is to reroute stormwater runoff from the offsite area utilizing a

drainage ditch along the western boundary of the Project site, that gradually releases water to the east of the Project site. The drainage ditch is sized for the 100-yr storm event. The ditch directs the drainage south then east along the site boundary until it discharges at the southeastern corner of the site at natural flow rates. To further recreate existing flow conditions and mitigate erosive impacts associated with this discharge, the design ties the release point to a level spreader. The level spreader distributes the stormwater runoff evenly along the entire east edge of the site, promoting even and controlled release to the existing grade. This drainage design will reduce erosion from the current site conditions as it will both ensure the flow is spread over the entire north to south portion of the site and will also reduce the tributary area by the 12.4-acre site area.

2.2.7 Perimeter Wall, Landscaping and Aesthetics

A 10-foot-tall perimeter wall around the site will be constructed that consists of a prefabricated masonry material for both visual enhancement, security and fire protection. This wall will be combined with perimeter landscaping and a 20-foot-tall visual screening fence along the northeastern perimeter to minimize or eliminate visual impacts from public views. A detailed Landscape Plan is provided in Appendix 2B.

The Project will incorporate an approximate 20-foot landscape buffer around the perimeter for screening and aesthetic enhancement. The landscape buffer will consist of a mixture of trees, shrubs, groundcover, and vines to create a varied, aesthetically pleasing visual buffer. Trees within the landscape buffer will include species native to southern California, 24–inch box size, with heights of 20 to 60 feet and widths of 15 to 40 feet, depending on the tree type. Additional information related to planting sizes, spacing, quantities, and representative tree photographs are included in Appendix 2B. All plantings will require minimal supplemental irrigation until established.

The applicant has provided visual simulations of the Project with landscaping from several public vantage points. Pursuant to CEC Application Requirements and Appendix G of the CEQA Guidelines, if the Project is located in an urbanized area the Project should not conflict with applicable zoning and other regulations governing scenic quality. As the City of San Juan Capistrano qualifies as an “urbanized area” under CEQA, the urbanized area threshold requiring an assessment of scenic quality policy and regulation consistency is the appropriate threshold to apply (and is referenced below. While visual simulations are not required to make this assessment, the applicant has offered these figures to further clarify the Project’s conformity with policies and standards governing scenic quality (See Section 4.13 herein, and See also Figures 4.13-2 and 2a and 4.13-3 and 3a)

2.2.8 Site Access and Security

Interstate-5 is the largest highway in the area and provides regional access to the Project site from the north and south. Access to the Project site will be provided via an existing access road off of Camino Capistrano approximately 0.6 miles northeast of the Project site. A new access road will be improved from the entry access road off Camino Capistrano along the east side of the property to the Project site. Road improvements shall consist of converting existing dirt roads into gravel roads and widening the roads to meet OCFA and SDGE standards (30-feet wide).

As noted above, perimeter walls will be installed around the perimeter of the Project site for safety and security purposes as well as for visual screening. Access will only be available to authorized personnel. A Knox box will be provided at all access gates to allow for emergency access.

Permanent motion-sensitive, directional security lights will be installed to provide adequate illumination around the substation area and points of ingress/egress. All lighting will be shielded and directed downward to minimize the

potential for glare or spillover onto adjacent properties. Security cameras will be placed on site and monitored 7 days a week and 24 hours per day.

2.2.9 Loop-In Transmission Line

A loop-in transmission line will be constructed that will transfer power to and from the proposed Project and the SDG&E Trabuco to Capistrano 138kV transmission line approximately 500 feet to the east of the Project site, which runs north-south adjacent to the railroad. The loop-in transmission line will be supported by up to 5 pole structures which will be sited to fully avoid Oso Creek. These poles consist of two poles on the Project site within the SDG&E switchyard, west of Oso Creek, and three pole on the east side of Oso Creek (two of which will be replacing existing poles); only one pole on the east side of Oso Creek will be new).

2.2.10 Fire Protection System

Compass Energy Storage LLC will use battery storage systems that are NFPA 855 Code compliant and UL certified and that include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. A fire protection system will be installed to automatically shut down any affected battery storage components and prevent the spread of the fire to the other battery storage modules.

The perimeter wall discussed above will also provide fire protection – both to prevent wildfire from impacting the site and to reduce the chance of an on-site fire from escaping beyond the property. The fire wall shall also serve as a decorative wall for the Project site. In addition, fire hydrants will be installed in accordance with OCFA standards.

In coordination with City and County fire and public safety officials, the Project will prepare a detailed Hazard Mitigation Analysis and Emergency Response Plan as part of the building permit process to be approved prior to the commencement of construction. (See Wildfire and Fire Prevention Section 4.17).

2.2.11 Operations and Maintenance Area

The Project would include up to six conex containers to house equipment and materials necessary to complete operations and maintenance activities. Additionally, there would be a prefabricated mobile office trailer with self-contained water and sanitary for technicians to utilize while on-site for routine inspections and maintenance of the Project.

2.3 Construction

2.3.1 Schedule and Workforce

The physical construction/site activities of the proposed Project is expected to last up to 18 months, including 3 months of testing and commissioning. Table 2-2 includes proposed construction phasing.

Table 2-2. Proposed Construction Phasing

Phase Name	Start Date	End Date	Days per Week	Work Days per Phase
Access Road Site Preparation, Grading, and Paving	1/13/2025	2/4/2025	5	16
Site Preparation	1/29/2025	2/12/2025	5	10
Switchyard Site Preparation	1/29/2025	2/12/2025	5	10
Site Grading	1/29/2025	3/12/2025	5	30
Switchyard Grading	1/29/2025	2/12/2025	5	10
Battery/Container Installation	3/13/2025	3/19/2026	5	265
Switchyard Installation	1/29/2025	12/4/2025	5	221
Loop-In Transmission Line Foundation and Tower Erection	12/29/2025	2/10/2026	5	31
Loop-In Transmission Stringing and Pulling	2/10/2026	2/24/2026	5	20
Stormwater Detention Structures and Waterline Installation and Landscaping Installation	3/13/2025	7/17/2025	5	90
Commissioning	3/20/2026	7/24/2026	5	90
Decommissioning	6/1/2050	1/1/2051	5	154

The proposed Project will be constructed by several specialized construction contractors. Construction will primarily occur during daylight hours, Monday through Saturday between 7:00 a.m. and 6:00 p.m., as required to meet the construction schedule. Any construction work performed outside the normal work schedule will be coordinated with the appropriate agencies and will conform to City regulations.

2.3.2 Site Grading and Earthwork

Construction activities will include excavation and grading of the Project site. Site preparation and construction will occur in accordance with all federal, state, and City zoning codes and requirements. Noise-generating construction activities will be limited to Monday through Saturday between 7:00 a.m. and 6:00 p.m. All stationary equipment and machines with the potential to generate a significant increase in noise or vibration levels will be located away from noise receptors to the extent feasible. The contractor will conduct construction activities in such a manner that the maximum noise levels at the affected buildings will not exceed established noise levels.

The Project site grading is anticipated to include approximately 15,480 cubic yards (cy) of cut and 74,070 cy of fill for a net of 58,590 cy.

All applicable federal, state, and local requirements and best management practices (BMPs) will be incorporated into the construction activities for the Project site. Beginning work on the Project site will involve preparing the land

for installation of the BESS-related infrastructure, access driveways, and temporary construction staging areas. The construction contractor will be required to incorporate BMPs consistent with the City zoning ordinance and with guidelines provided in the California Stormwater Quality Association's Construction BMP Handbook (CASQA 2019), as well as a soil erosion and sedimentation control plan to reduce potential impacts related to construction of the proposed Project. Prior to initial construction mobilization, pre-construction surveys will be performed, and sediment and erosion controls will be installed in accordance with state and City guidelines. Stabilized construction entrances and exits will be installed at driveways to reduce tracking of sediment onto adjacent public roadways.

Site preparation will be consistent with City BMPs and the South Coast Air Quality Management District Rule 403: Fugitive Dust (SCAQMD 2005). Site preparation will involve the removal and proper disposal of existing debris that would unduly interfere with Project construction or the health and safety of on-site personnel. Dust-minimizing techniques will be employed, such as placement of wind control fencing, application of water, and application of dust suppressants. Conventional grading will be performed throughout the Project site but minimized to the maximum extent possible to reduce unnecessary soil movement that may result in dust. Earthworks scrapers, excavators, dozers, water trucks, paddlewheels, haul vehicles, and graders may all be used to perform grading. Land-leveling equipment, such as a smooth steel drum roller, will be used to even the ground surface and compact the upper layer of soil to a value recommended by a geotechnical engineer for structural support. Soil movement from grading will be balanced on the site. However, Class II road base will be imported to create necessary compaction under the equipment, as determined by geotechnical testing and Project specifications.

Trenching will be required for placement of underground electrical and communication lines as well as stormwater facilities, and may include the use of trenchers, backhoes, excavators, haul vehicles, compaction equipment, and water trucks. After preparation of the site, concrete pads, equipment enclosures, and equipment vaults will be installed per geotechnical engineer recommendations. The SDG&E switchyard and Project substation area will have a grounding grid installed and will be covered with aggregate surfacing for safe operation.

During this work, multiple crews will be working on the site with various equipment and vehicles, including vehicles for transporting the batteries and other equipment. As the BESS enclosures are constructed, the electrical collection and communication systems will be installed. The wiring will connect to the appropriate electrical and communication terminations and the circuits will be checked and commissioned prior to operation. The total number of construction workers (consisting of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel) will consist of approximately 75 to 100 workers (average). It is estimated that construction will require the vehicle trips and equipment listed in Table 2-3.

Table 2-3. Construction Scenario Assumptions

	One-Way Vehicle Trips			Equipment		
Construction Phase	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Access Road Site Preparation, Grading, and Paving	40	4	20	Graders	1	8
				Tractors/loaders/ backhoes	1	8
				Rubber-tired loaders	1	8
				Skid steer loaders	1	8

Table 2-3. Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Usage Hours
Site Preparation	40	4	20	Graders	2	8
				Tractors/loaders/ backhoes	2	8
				Rubber-tired loaders	2	8
				Skid steer loaders	2	8
Switchyard Site Preparation	40	4	2	Tractors/loaders/backhoes	2	8
				Rubber-tired dozers	2	8
Grading	40	4	80	Graders	4	8
				Rubber-tired loaders	2	8
				Tractors/loaders/backhoes	2	8
				Plate compactors	2	8
				Rollers	2	8
				Skid steer loaders	2	8
Switchyard Grading	40	4	0	Rollers	2	8
				Rubber-tired dozers	2	8
				Tractors/loaders/backhoes	2	8
Wall Earthwork and Installation	40	4	40	Excavators	2	8
				Trenchers	2	8
				Tractors/loaders/backhoes	2	8
				Rough terrain forklifts	2	8
Battery/Container Installation	40	20	8	Air compressors	4	8
				Cranes	2	8
				Excavators	2	8
				Generator sets	4	8
				Plate compactors	2	8
				Rollers	2	8
				Rough terrain forklifts	2	8
				Skid steer loaders	2	8
				Tractors/loaders/backhoes	2	8
Switchyard Installation	40	20	0	Aerial lifts	4	8
				Air compressors	2	8

Table 2-3. Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	Average Daily Vendor Truck Trips	Average Daily Haul Truck Trips	Equipment Type	Quantity	Usage Hours
				Bore/drill rigs	2	8
				Cranes	1	8
				Excavators	1	8
				Generator sets	2	8
				Rollers	2	8
				Rough terrain forklifts	2	8
				Rubber-tired dozers	2	8
				Skid steer loaders	2	8
				Tractors/loaders/backhoes	4	8
				Trenchers	4	8
Loop-In Transmission Foundation and Tower Erection	10	4	0	Air compressors	2	8
				Cranes	1	8
				Forklifts	2	8
				Generator sets	2	8
				Pumps	2	8
				Welders	2	8
Loop-In Transmission Stringing and Pulling	8	4	0	Forklifts	2	8
				Tractors/loaders/backhoes	2	8
				Generator sets	2	8
Stormwater Structures and Waterline Installation and Landscaping Installation	40	4	8	Excavators	2	8
				Trenchers	2	8
				Tractors/loaders/backhoes	2	8
Commissioning	160	0	0	NA	NA	NA
Decommissioning	40	4	0	Cranes	2	8
				Tractors/loaders/backhoes	2	8
				Concrete/industrial saws	2	8
				Rubber-tired dozers	2	8

2.3.3 Construction Water Use

During construction of the proposed Project, water will be required for common construction-related purposes, including but not limited to dust suppression, soil compaction, and grading. Dust-control water may be used during ingress and egress of on-site construction vehicle equipment traffic and during the construction of the energy storage equipment. A sanitary water supply will not be required during construction because restroom facilities will be provided by portable units serviced by licensed providers.

The water used is anticipated to be supplied by purchase from the local water purveyor, Moulton Niguel Water District.

2.3.4 Solid and Nonhazardous Waste

The Project will produce a small amount of solid waste from construction activities. This may include paper, wood, glass, plastics from packing material, waste lumber, insulation, scrap metal and concrete, empty nonhazardous containers, and vegetation waste. These wastes will be segregated, where practical, for recycling. Non-recyclable wastes will be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III (nonhazardous waste) landfill.

2.3.5 Hazardous Materials

The hazardous materials used for construction will be typical of most construction projects of this type. Materials will include small quantities of gasoline, diesel fuel, oils, lubricants, solvents, detergents, degreasers, paints, ethylene glycol, dust palliatives, herbicides, and welding materials/supplies. A hazardous materials business plan will be provided. The hazardous materials business plan will include a complete list of all materials used on site and information regarding how the materials will be transported and in what form they will be used. This information will be recorded to maintain safety and prevent possible environmental contamination or worker exposure. During Project construction, material safety data sheets for all applicable materials present at the site will be made readily available to on-site personnel.

2.3.6 Hazardous Waste

Small quantities of hazardous wastes will most likely be generated over the course of construction. These wastes may include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, waste batteries, and spent welding materials. Workers will be trained to properly identify and handle all hazardous materials. Hazardous waste will be either recycled or disposed of at a permitted and licensed treatment and/or disposal facility. All hazardous waste shipped off site for recycling or disposal will be transported by a licensed and permitted hazardous waste hauler.

2.4 Operations

The BESS and all associated equipment will be remotely monitored and controlled. Qualified technicians would visit the site approximately 1-2 times per month to conduct routine inspections and maintenance as well as semi annual and annual services. Periodically, batteries and various components may be replaced or renewed to ensure optimal performance.

Operational water will be limited to water necessary for landscape irrigation and to supply on-site fire hydrants.

2.4.1 Solid and Nonhazardous Waste

The Project will produce a small amount of waste associated with maintenance activities, which could include broken and rusted metal, defective or malfunctioning electrical materials, empty containers, and other miscellaneous solid waste, including typical refuse generated by workers. Most of these materials will be collected and delivered back to the manufacturer or to recyclers. Non-recyclable waste will be placed in covered dumpsters and removed on a regular basis by a certified waste-handling contractor for disposal at a Class III landfill.

2.4.2 Hazardous Materials

Limited amounts of hazardous materials will be stored or used on the site during operations, including diesel fuel, gasoline, and motor oil for vehicles; mineral oil to be sealed within the transformers; and lead-acid-based batteries for emergency backup. Appropriate spill containment and cleanup kits will be maintained during operation of the Project. A spill prevention control and countermeasures plan will be developed for site operations.

2.4.3 Hazardous Waste

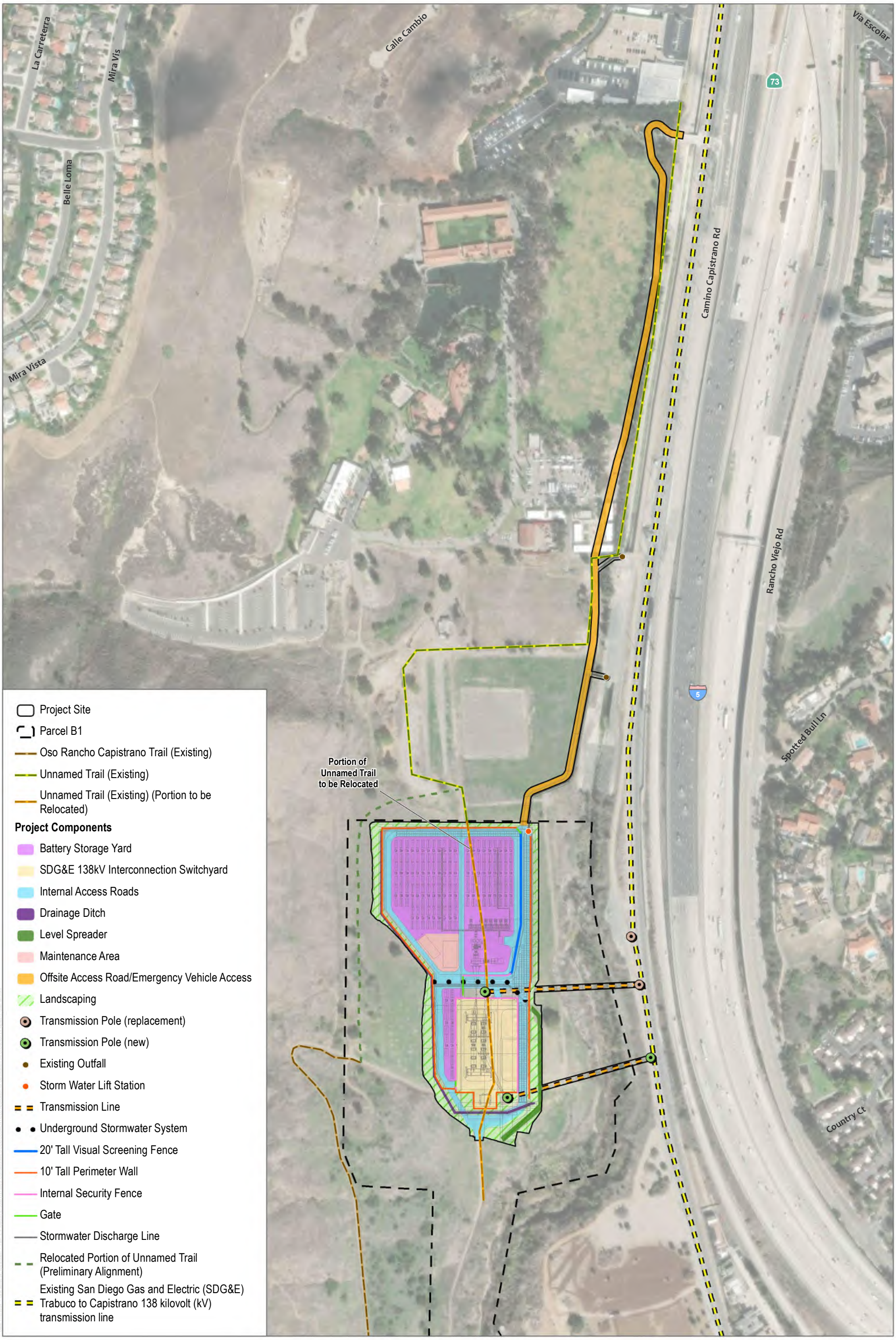
Fuels and lubricants used in operations will be subject to the spill prevention control and countermeasures plan to be prepared for the proposed Project. Solid waste, if generated during operations, will be subject to the material disposal and solid waste management plan to be prepared for the proposed Project.

2.5 Decommissioning

Decommissioning of the Project at the end of its useful life would include the removal of BESS equipment from the foundations, disconnection of wiring, and removal of site infrastructure. A Decommissioning Plan has been prepared and included as part of this application (see Appendix 2C). The facilities would be decommissioned and dismantled, and the site would be restored. The vast majority of the Project components are recyclable and the batteries and other equipment and materials will be recycled to the extent feasible to minimize disposal in landfills. The switchyard area will be deeded to SDGE and will remain in place for ongoing use and operation.

Decommissioning activities will require a workforce of approximately 20 workers and would take approximately 4 months to complete. In general, activities would include the following:

- Dismantling and removal of all aboveground equipment (battery enclosure units, Excavation and removal of all underground cabling less than 3 feet below ground
- Removal of fencing
- Break up and removal of concrete pads and foundations
- Scarification of compacted areas
- Seeding of disturbed areas with a native seed mix



SOURCE: Bing Maps 2023; Sargent & Lundy 2023

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DR LAND-2. Updated Figure 2-1, Site Plan

Compass Battery Energy Storage Project

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Attachment B

Updated Section 4.17 Wildfire and Fire Protection

4.17 Wildfire and Fire Protection

This section describes the potential effects of the construction, operation, and decommissioning of the Project may have on potential wildfire impacts. The information presented is based on a review of existing resources and applicable laws, regulations, guidelines, and standards. Publicly available sources were reviewed in the development of this section, including, but not limited to, the CAL FIRE Fire and Resource Assessment Program (FRAP) database, the City of San Juan Capistrano General Plan, the City of San Juan Capistrano Municipal Code, and the County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan. Section 4.17.1 describes the existing environment that could be affected, including vegetation and fuels, climate, topography, fire hazard severity zone designation, fire history, and emergency response and fire protection. Section 4.17.2 identifies potential environmental impacts that may result from Project construction, operation, maintenance, and decommissioning. Section 4.17.3 discusses cumulative effects. Section 4.17.4 identifies mitigation measures that should be considered during Project construction, operation, maintenance, and decommissioning. 4.17.5 provides an overview of the regulatory setting related to wildfire and presents laws, ordinances, regulations, and standards (LORS) applicable to wildfire. Section 4.17.6 identifies regulatory agency contacts and Section 4.17.7 describes any permits required for the Project related to wildfire resources. Section 4.17.8 provides references used to develop this section.

Analysis for the Project is based in-part on information from the Fire Protection Technical Report that has also been prepared to clarify the content and reliability of lithium-iron phosphate (LFP) systems, analyze fire behavior and wildfire risk and provide recommendations based on the fire environment at the Project site (see Appendix 4.17A).

4.17.1 Affected Environment

4.17.1.1 Regional Setting

The Project is located in the southern portion of Orange County, California, in the northwestern portion of the City of San Juan Capistrano.

Regionally, the Project Area occurs within a valley between the Santa Ana Mountains to the northeast and the Laguna Woods to the west, west of the Peninsular Range and approximately 5 miles from the Pacific Ocean. Interstate 5 and State Route 73 are major transportation corridors in the region, and the Project is immediately west of Interstate 5. Oso Creek, which originates in the Cleveland National Forest and travels southwest through southern Orange County before connecting with the Pacific Ocean, is located to the immediate east of the Project. The Project area is located on the San Juan Capistrano, California, U.S. Geological Survey 7.5-minute map on Sections 25, 26, 35, and 36 of Township 75, Range 8 West.

The 12.4-acre development area for the BESS facility would occur within a larger 40.8-acre parcel. The Project area currently consists of a mixture of undeveloped and developed lands. Mixed low intensity uses are located on the northern side of the project site associated with Saddleback Church Rancho Capistrano; it contains dirt roads and light, non-commercial agricultural activity combined with church buildings for various programs. Besides a few small dirt trails and roads, the southern portion of the project site is undeveloped, with no sign of recent agricultural activity. Oso Creek lies at the bottom of nearby steep slopes; outside of these steep areas, the Project Area is flat to gently sloping.

Land use surrounding the Project consists of residential development to the north, east, and west. Interstate 5 occurs to the east, separating the Project Area from other developed areas. Residential development to the west is

denser than the residential development to the east. Several schools, churches, and agricultural areas are scattered in areas surrounding the Project Area. Several creeks, such as Oso Creek, Arroyo Trabuco, and Horno Creek, occur in the vicinity that eventually drain to the Pacific Ocean to the south.

4.17.1.2 Vegetation/Fuels

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 (bark thickness, leaf size, branching patterns), and overall fuel loading. For example, grass-dominated plant communities become seasonally prone to ignition and produce lower intensity, higher spread rate fires. As described in Section 4.2, Biological Resources, vegetation communities on the proposed Project site are dominated by agricultural land consisting of non-native annual grasses. The Project area also consists of Disturbed Habitat and Urban / Developed Areas. Vegetation communities and land covers observed in the Project Area are depicted on Figure 4.2-8, Vegetation Communities / Land Cover Types. Additional vegetation communities found on the project site include the following: soft scrub / mixed chaparral, coast live oak, Baccharis (riparian), Fremont cottonwood/mixed willow (*Populus fremontii-Salix laevigata*) Riparian Mixed Hardwood Woodland, and California Sagebrush (*Artemisia californica*) Scrub Occupied by Coastal California Gnatcatcher (*Polioptila californica*).

Annual grasslands can sustain the spread of wildfire after the grass has cured, which typically occurs around the onset of fire season, April to October, but may occur earlier or later in the year based on conditions during the winter and spring. Cured annual grasslands contain a nearly continuous expanses of grass only broken up by roads, waterways, or rocky areas. Since cured grass is a lightweight fuel, meaning it has a high surface area to mass ratio, it comes into equilibrium with the moisture in the atmosphere relatively quickly (within one hour) and is available to burn when the moisture in the air (relative humidity) drops below 15% (Livingston and Varner 2016) which can occur during the hottest and driest periods of the day throughout the fire season. This availability to burn combined with the continuous vegetation can sustain the growth of fast moving, large fires. However, it is important to identify that the growth of these fires are significantly influenced by the time of day or changes in weather conditions when relative humidity increases. Fire activity can dramatically decrease during the night or during periods when the relatively humidity rises above 15%.

4.17.1.3 Climate

Climate in the Project area is characterized as a hot-summer Mediterranean climate with cool, wet winters and hot, dry summers. Temperatures in the Project area range between average lows of 49°F during the coldest months to average highs of 78°F during the summer months. From August to October, maximum temperatures may be around 85°F. Most of the precipitation falls between November and April. Winds in the proposed Project area are predominantly out of the west-southwest for most of the year. Average wind speeds vary between 3 and 10 mph (Weather Spark 2024). The Project area may also be subject to Santa Ana winds, which are seasonal hot and dry winds that can dry out vegetation, make vegetation more fire prone, and exacerbate wildfire risks.

Weather conditions conducive to the ignition and spread of a wildfire occur on average from March to October. During this period, the window when the grass at the proposed Project site is available to burn varies. In March, there may be a relatively short window during the day when temperatures are high enough and relative humidities low enough that fire can spread in the grass. This window increases as the year progresses, peaking in July and August during the hottest and driest periods of the year. As the year progresses, this window will decrease again as the temperature decreases and relatively humidity increases.

4.17.1.4 Topography

Topography influences fire risk by affecting fire spread rates. Typically, steep terrain results in faster fire spread up slope and slower spread down slope. Terrain that forms a funneling effect—such as chimneys, chutes, or saddles—on the landscape can result in especially intense fire behavior, including faster spread and higher intensity. Conversely, flat terrain tends to have little effect on fire spread, resulting in fires that are driven by vegetation and wind.

The terrain for the Project site is relatively flat, as elevation ranges from approximately 165 to 270 feet above mean sea level. The Project site is bounded from the west and east by steep slopes, and the aspects of both of these slopes are respectively facing east and west.

4.17.1.5 Fire Hazard Severity Zone Designation

CAL FIRE's FRAP database includes map data documenting areas of significant fire hazards in the state. These maps categorize geographic areas of the state into different fire hazard severity zones (FHSZs). The classifications include Moderate, High, and Very High FHSZs. CAL FIRE uses FHSZs to classify anticipated fire-related hazards for the entire state, and includes classifications for State Responsibility Areas, Local Responsibility Areas, and Federal Responsibility Areas. Fire hazard severity classifications consider vegetation, topography, weather, crown fire production, and ember production and movement.

The proposed Project site and the surrounding area are not located within a State Responsibility Area (SRA) or Local Responsibility Area (LRA) Very High Fire Hazard Severity Zone. The closest SRA/VHFHSZ to the east is across the I-5 Freeway in the Mission Viejo area, approximately one mile from the Project site. To the west the closest SRA/VHFHSZ is west of Laguna Niguel approximately 2.5 miles from the Project site (Figure 4.17-1, State Responsibility Areas, and Figure 4.17-2, Fire Hazard Severity Zones). The closest VHFHSZ within LRA is located approximately 1.8 miles southeast of the Project site.

The California Public Utilities Commission (CPUC) has published High Fire Threat District (HFTD) maps. The HFTD maps show areas where there is an increased risk (including likelihood and potential impacts on people and property) for utility associated wildfires (CPUC 2023). Figure 4.17-3, CPUC Fire Threat Tiers, shows that the Project site and the surrounding area are not located within a Tier 2 (Elevated) or Tier 3 (Extreme) HFTD. The closest HFTD is within Tier 2 approximately 0.5-mile to the east and Tier 2 and Tier 3 approximately two miles to the west.

4.17.1.6 Fire History

Fire history is an important component of evaluating how prone to ignition and fire spread a landscape is. Fire history data provides valuable information regarding fire spread, fire frequency, most vulnerable areas, and notable ignition sources, amongst others. In turn, this understanding of why fires occur in an area and how they typically spread can then be used for pre-planning. This fire history analysis uses the FRAP database. FRAP summarizes fire perimeter data dating to the late 1800s, but is incomplete since it only includes fires over 10 acres in size and has incomplete perimeter data, especially before the mid-20th century (Syphard and Keeley 2016). However, the data does provide a summary of recorded fires and can be used to show whether large fires have occurred in the proposed Project area, which indicates whether they may be possible in the future.

According to available data from the CAL FIRE FRAP records, there have been 40 fires within five miles of the proposed Project site but no fires have burned onto the development footprint of the BESS facility at the Project site (CAL FIRE 2022). Twenty-three of those 40 fires have occurred within the past 10 years, from 2016 to 2022.

The CPUC collects and publishes data on utility-caused fires. Figure 4.17-4, Fire History, shows a map of the recorded fire perimeters within five miles of the proposed Project site.

4.17.1.7 Emergency Response and Fire Protection

The proposed Project site is located on LRA lands where the local government has the primary responsibility for fire suppression and emergency response. OCFA is responsible for fire suppression and prevention and would be the fire authority having jurisdiction. All fire departments within the County provide mutual aid to one another, responding to calls regardless of jurisdictional boundaries (OCFA 2022).

The nearest fire station is OCFA Station #9, located approximately 1.6 miles north of the Project site (maximum travel distance is approximately 2.5 miles). Table 4.17-1 summarizes the location, equipment, staffing levels, maximum travel distance, and estimated travel time for OCFA Station #9 and the next nearest fire stations (OCFA 2024).

Table 4.17-1 Closest Emergency Response Station Summary[1]

Station Name	Location	Apparatus	Daily Staffing	Maximum Travel Distance	Travel Time
OCFA Station #9	9 Shops Blvd., Mission Viejo, CA 92691	Medic Engine 9, Truck 9, Swift Water 9	2 Fire Captains, 2 Fire Apparatus Engineers, 4 Firefighters	2.5 miles	4.9 minutes
OCFA Station #7	31865 Del Obispo St, San Juan Capistrano, CA 92675	Engine 7, Engine 307*, Medic 7, Patrol 7, Water Tender 7	1 Fire Captain, 1 Fire Apparatus Engineer, 3 Firefighters, Reserve Firefighters	2.9 miles	5.6 minutes
OCFA Station #39	24241 Avila Rd. Laguna Niguel, CA 92677	Medic Engine 39,Engine 339*	1 Fire Captain, 1 Fire Apparatus Engineer, 2 Firefighters	4 miles	7.5 minutes
OCFA Station #49	31461 Street of the Golden Lantern Laguna Niguel, CA 92677	1 Fire Captain, 1 Fire Apparatus Engineer, 2 Firefighters	Medic Truck 49	4.1 miles	7.6 minutes
OCFA Station # 5	23600 Pacific Island Dr. Laguna Niguel, CA 92677	Medic Engine 5, Engine 105	1 Fire Captain, 1 Fire Apparatus Engineer, 2 Firefighters	4.3 miles	8 minutes

1 Travel distances are derived from Google road data while travel times are calculated using response speeds of 35 mph, consistent with nationally recognized National Fire Protection Association (NFPA) standard 1710 and Insurance Services Office (ISO) Public Protection Classification Program's Response Time Standard formula (Time=0.65 + 1.7(Distance)). The ISO response travel time formula discounts speed for intersections, vehicle deceleration, and acceleration and does not include turnout time.

* = cross-staffed by on-duty personnel (OCFA 2024)

For the initial full alarm, which consists of personnel, equipment and resources dispatched upon notification of a structure fire, the National Fire Protection Association (NFPA) Standard 1710 sets a total response objective of 8 minutes for low and medium hazard incidents and 10 minutes and 10 seconds for high hazard / high-rise incidents (NFPA 1710, 2020). The San Juan Capistrano General Plan Public Services and Utilities Element notes that OFCA has adopted the following service standards for the provision of fire protection within San Juan Capistrano (City of San Juan Capistrano, 1999):

- First-in fire engine should arrive on-scene to both medical aids and fire within five (5) minutes 80 percent of the time
- First-in truck company should arrive on-scene to fires within 10 minutes 80 percent of the time
- First-in paramedic companies should arrive on-scene at all medical aids within eight (8) minutes 90 percent of the time.

The OCFA 2022-2023 Adopted Budget notes that 80% of emergency calls had a response time of 8 minutes and 16 seconds, and that 90% of emergency calls had a response time of 9 minutes and 54 seconds. While the response times noted by the OCFA fulfill the second and third service standard bullets, it should also be noted that these service standards were last updated in 1999.

4.17.2 Impact Analysis

The following subsections cover potential wildfire related impacts associated with the construction and operation of the proposed Project.

4.17.2.1 Methodology

To identify and assess potential impacts related to wildfire, Dudek reviewed publicly available information from CAL FIRE, City of San Juan Capistrano, OCFA, Fire Protection Technical Report prepared by Dudek (Appendix 4.17A), and information provided by the Applicant.

4.17.2.2 Impact Evaluation Criteria

The potential for impact related to hazardous material were evaluated using the criteria described in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (sections 15000-15387, Title 13, California Code of Regulations, Chapter 3). A Project would have a significant environmental impact in terms of wildfire if it is located in or near SRAs or lands classified as VHFHSZs and would:

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

4.17.2.3 Impact Evaluation

4.17.2.3.1 Emergency Response

The 2020 County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan (LHMP) was developed collaboratively with emergency management staff, County and external partners, and Orange County residents. The mission of the LHMP is to promote sound public policy designed to protect residents, critical facilities, infrastructure, key resources, private property, and the environment from natural hazards in unincorporated areas, fire hazards in the Fire Authority service area, and County and OCFA owned facilities.

The City has also identified several evacuation routes for emergency access. Government Code 65302(g) requires communities to identify residential developments in any hazard area identified in the safety element that does not have at least two emergency evacuation routes. Per the evacuation route maps in the Safety Element of the General Plan, Camino Capistrano is identified as an evacuation routes (City of San Juan Capistrano 2022).

Primary access roads on-site would be a minimum of 20 feet in width. All on-site roads would consist of aggregate base in compliance with OCFA requirements. Activities associated with the Project would not impede the free movement of emergency response vehicles. Construction vehicles would access the Project site(s) from I-5, which would provide connection to local access roads (i.e., Camino Capistrano). During construction, materials would be placed within the Project boundaries adjacent to the current phase of construction in order to avoid any access conflicts in case of emergency evacuations.

Activities associated with the project would not impede existing emergency response plans or evacuation routes for the project site and/or other land uses in the project vicinity. The Project would not result in any closures of I-5. All secondary roads, such as Camino Capistrano, would be kept open for public use during project construction and operations. All vehicles and stationary equipment would be staged off public roads and would not block or restrict emergency access routes.

The Project would adhere to all safety practices addressed in the LHMP, and BMPs and training as described in Section 4.5.4.1, Construction Phase, and Section 4.16, Worker Health and Safety would be implemented. When the Project is in operation, the Project would not include on-site personnel on a daily basis, which results in zero or a very low number of vehicles that would be evacuating the area during a wildfire event. Emergency response plans may need to be updated to document the presence of the BESS at this location along with basic BESS firefighting strategies, which are already part of the local fire authority's response training and preparedness for other BESS facilities within its jurisdiction. Additionally, travel time to the proposed Project site for the first responding units from OCFA Station #9 is not expected to exceed 5 minutes, and the Project site is within the 8 minute and 10-minute response periods set by NFPA 1710. Therefore, the Project would not be expected to impair local emergency response or evacuation plans.

In addition, the project will prepare an individual detailed Emergency Response Plan (ERP) in coordination with the OCFA and other emergency responders prior to the commencement of construction. This ERP will be based on a Hazard Mitigation Analysis (HMA) prepared by experts and tailored to the specific BESS equipment to ensure prevention and management practices are included in the ERP. This ERP will include and exceed all recommendations included in SB 38, recent California legislation requiring the preparation of ERP's for BESS projects.

4.17.2.3.2 Wildfire Risk and Pollutant Containment in a Wildfire Event

Construction and Decommissioning

The construction and decommissioning phases of the proposed Project could contribute to wildfire risk due to the potential for sparks and accidental ignitions during construction activities. Construction and decommissioning activities would introduce potential ignition sources to the proposed Project site, including the use of heavy machinery, vehicles, welding activities or other hot work. The Project would be subject to OCFA requirements, such as limiting or ceasing construction and decommissioning work during high-wind weather events and implementing ongoing fire patrols during fire season. Additionally, pre-construction site preparation, including vegetation management would reduce the wildfire hazards on site. Vegetation management would reduce the risk of wildfire spreading from within the active construction areas to offside fuel beds. Provided site improvements and vegetation management requirements are appropriately implemented and approved by the OCFA, construction and decommissioning activities are not anticipated to exacerbate wildfire risk to adjacent areas or such that proposed Project workers would be exposed to the uncontrolled spread of a wildfire or pollutant concentrations from a wildfire.

Operation

The proposed BESS facility includes the installation of an approximately 250MW BESS, related components, and a loop-in transmission line connecting the BESS facility to an existing SDG&E transmission line. The proposed Project site currently is dominated by California annual grassland composed of non-native grasses that could serve as potential fuel sources. Existing slopes west of the Project site and open space south of the Project site present areas of potential wildfire hazard. Existing potential ignition sources near the Project site include vehicles traveling along Interstate 5, Camino Capistrano, the nearby railroad line, and accidental or arson related ignitions. The power lines, switchyard, and related infrastructure could contribute to the risk of wildfire ignition.

As mentioned in the Project description and as detailed in the Fire Protection Technical attached herein at Appendix 4.17A, the proposed BESS facility would use a lithium-iron phosphate technology, which would be NFPA 855 Code compliant, and compliant with all applicable UL testing, and include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. ~~Included in the BESS are the fire suppression system (FSS) and the heating, ventilation, and air conditioning (HVAC) system. The FSS system is composed of smoke detectors, gas detectors and aerosols, which serve the primary purpose of preventing fire spread in time should any open flame or gas signal appear in the battery system. The HVAC system would maintain the temperature of the battery system within the allowable operating temperature range. An auxiliary distribution box would also be included which provides auxiliary power for the whole control system and liquid cooling system.~~ In addition, the site would include infra-red sensors and visual monitoring by the operations team as part of its Hazard Mitigation Analysis and Emergency Response Plan. The SCADA system and grid-connected alarm connections would be triggered by any malfunction resulting in a change in power production well in advance of a thermal incident. The combination of these features would ensure the BESS facility would be in compliance with California Fire Code (CFC) Sections 1207.8.1 through 1-1207.8.3.

The Fire Protection Technical Report (Appendix 4.17A) conducted a fire scenario assessment examining what wildfire may look like approaching the project site from the north and south. Even with the most extreme conditions in mind for existing site conditions, the level terrain and maintained vegetation tempers the anticipated wildfire behavior. Modeling of post-development conditions with fuel modification recommendations integrated indicates a reduction in flame length and intensity. See Appendix 4.17A, Fire Protection Technical Report, Figure 4.17-5, Behave Plus Analysis Map, and Figure 4.17-6, Fuel Modification Plan, for additional fire behavior modeling information.

The vegetation management requirements established by Section 1207.5.7 of the CFC are that areas within 10 feet on each side of outdoor energy storage systems shall be cleared of combustible vegetation and other combustible growth. The code does permit single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground cover provided that they do not form a means of readily transmitting fire. Additionally, Section 1207.8.3 of the CFC requires that the energy storage systems would be separated by a minimum of 10 feet from lot lines, public ways, buildings, stored combustible materials, hazardous materials, high-piled stock, and other exposure hazards. CFC section 1207.8.1 requires remote outdoor installations to be located more than 100 feet from the hazards previously mentioned. Similarly, CFC Section 1207.5.8 requires energy storage systems to be separated from any means of egress by at least 10 feet, but this can be reduced if large-scale fire testing in accordance with UL 9540A is completed. The proposed project design complies with and substantially exceeds the requirements.

Vegetation management would also occur around power poles and powerlines. California Public Resources Code 4292 and 4293 requires that a minimum of 10 feet of vegetation clearance must be maintained around every electrical pole or tower and that the appropriate clearance be maintained around electrical transmission and distribution lines for the operating voltage. Given the grass dominated vegetation and lack of sizeable trees in the area of the loop-in transmission line, there are not anticipated to be any vegetation clearance issues related to the transmission lines.

During operations, the facilities would be remotely operated year-round, lessening the risk that project occupants may be exposed to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire during maintenance activities. In the event that a wildfire may occur, on site technicians would be instructed to follow evacuation procedures outlined in the Operations Health and Safety Program. Additional details for this program are in Section 4.16 Worker Health and Safety, 4.16.1.3.2 Operations Health and Safety Program. Additionally, potential pollutants generated in the event of a wildfire would be contained within the on-site battery enclosures. The enclosures would be NFPA Standard 855 compliant and would be equipped with a fire extinguishing system to ensure fire safety. If potential pollutants are able to escape the enclosures, the non-combustible perimeter wall will serve as an additional method of containment. Therefore, it is not anticipated that project occupants would be exposed to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire due to slope, prevailing winds, and other factors while on-site during operations.

Summary

Given the region's fire history, it can be anticipated that periodic wildfires will occur in the open space areas of City of San Juan Capistrano, with the vegetated areas surrounding the proposed Project site being no exception. Given the climatic, vegetative, topographic characteristics, and local fire history of the area, the proposed Project site, once developed, could be subject to periodic wildfires that may burn onto or spot into the site.

As with any development in this location, the proposed Project would introduce potential ignition sources to the site. However, all new BESS components would be constructed to City of San Juan Capistrano Fire Code, NFPA 855, and 2022 CFC standards (or the current edition). The proposed Project would implement vegetation management throughout the BESS facility. Given the monitoring system will shut off the unit should it sense any abnormal conditions, a thermal runaway event is highly unlikely, but should it occur, the fire protection and prevention equipment will either extinguish the fire or isolate the event to a single enclosure with limited range. The UL 9540Atesting ensures that that any fire from an individual BESS would not spread to adjacent units. (It is notable that in the few commercial battery storage thermal incidents that have occurred, fire has not has spread beyond the individual cabinet affected). Combined with the planned vegetation management, setbacks and masonry

perimeter walls, there would be a low likelihood of a fire spreading from a BESS enclosure offsite. Fires from off-site would not have continuous fuels across this site and would therefore be expected to burn around and/or over the site via spotting. Burning vegetation embers may land on proposed Project components but are not likely to result in ignition based on ember decay rates the non-combustible and ignition-resistant materials that will be used on site, and the planned grading and vegetation management. As such, accidental fires within the maintained landscape of the Project would have limited ability to ignite or spread. It should be noted that while these standards would provide a high level of protection for the proposed Project, there is no guarantee that compliance with these standards would prevent damage or destruction of BESS components by fire in all cases.

Given the fire protection systems of BESS enclosures, the UL 9540A testing compliance, and the vegetation management and setbacks, the proposed Project, once developed, is not anticipated to facilitate wildfire spread. In addition, the Project is designed to reduce projected flame lengths to levels that would be manageable by firefighting resources for protecting the site's components. This will be detailed in the ERP to be prepared for the project in collaboration with the OCFA. Additional recommendations outlined in the Fire Protection Technical Report that would further reduce wildfire risk include:

- 20' FMZ – entire area within walls to be void of vegetative fuel – gravel or similar surface.
- 10' tall perimeter precast, decorative concrete walls to OCFA satisfaction
- Landscaped areas on the outside of the perimeter wall will be limited to fire-resistant landscaping consistent with fuel modification zone requirements
- Maintain FMZs twice-yearly or more as needed

4.17.2.3.3 Wildfire Risk of Associated Infrastructure

Roads

The Project would involve improvement of the access road off Camino Capistrano to the Project site. The added human activity and vehicle activity would introduce new potential ignition sources to the Project area during construction. However, vegetation would be removed where paved and gravel roads would be constructed and where fill would be placed from grading operations. Construction of connections to existing roadways would provide increased accessibility for emergency services to the proposed Project site. Further, site access, including road widths and connectivity, would comply with compliance with the OCFA and SDG&E standards. Additionally, all construction related vehicles would be required to have equipment capable of suppressing construction-related ignitions. The proposed Project ownership would be responsible for long term funding and maintenance of private roads and fire protection systems. Therefore, installation and maintenance of site access roads in accordance with all relevant development codes is not anticipated to exacerbate wildfire risk.

BESS

While development of a battery energy storage system and the associated loop-in transmission line would introduce new potential ignition sources to the proposed Project site, the site would be largely converted from readily ignitable fuels to BESS enclosures and associated components on graded and maintained areas. The proposed Project would be developed according to all existing building codes and fire codes, as indicated in the City of San Juan Capistrano Fire Code (City of San Juan Capistrano Municipal Code, Section 8-10.01), which adopts the 2022 California Fire Code, including Chapter 12 Section 1207 Electrical Energy Storage Systems and includes information for clearances and vegetation control. These codes include provisions for fuel modification and defensible space for

fire prevention and safety. The BESS cabinets contain extensive fire prevention and abatement equipment. Additional fire prevention and management systems are included in the project design, including infrared and video monitoring. Management of these cabinets in a thermal incident will be addressed in detail in the Hazard Mitigation Analysis (HMA) and Emergency Response Plan (ERP) prepared for the project, which incorporates and exceeds all of the recommendation contained in SB 38, recent legislation requiring emergency response plans for BESS.

Vegetation Management

The proposed BESS facility would be maintained free from combustible vegetation to allow for fire protection mitigation and defensible space consistent with local regulation. This would surpass the minimum of 10 feet around BESS enclosures stated in the CFC. Additionally, a minimum of 10 feet of vegetation clearance will be provided around all power poles/towers as well as powerlines associated with the proposed project and associated loop-in transmission line. Adequate vegetation management should be performed before bringing any combustible materials on to the project site, and vegetation management activities would occur prior to the start of construction and throughout the life of the Project. Consequently, the associated vegetation management activities would not exacerbate fire risk, provided that fuel modification and other vegetation management activities are implemented and enforced according to OCFA, county, and state requirements. The proposed vegetation management activities would reduce the fire risk by thinning or removing combustible vegetation.

Summary

Installation and maintenance of project roads, fuel modification, and other associated infrastructure would not exacerbate wildfire risks, provided that the appropriate fire prevention, access, and vegetation management activities are implemented as required by the OCFA, County code, state requirements. The roads, compliant battery energy storage system, loop-in transmission line, and vegetation management would contribute to reducing or mitigating the risk of wildfire. Therefore, the installation and maintenance of associated infrastructure is not anticipated to exacerbate wildfire risk**.**

4.17.2.3.4 Post-fire Slope Instability, Flooding or Landsliding

Vegetation plays a vital role in maintaining existing drainage patterns and the stability of soils. Plant roots stabilize the soil, and leaves, stems and branches intercept and slow water, allowing it to percolate into the soil more effectively. Removal of surface vegetation reduces the ability of the soil surface to absorb rainwater and can allow for increased runoff that may include large amounts of debris or mudflows. If hydrophobic conditions exist post-fire, the rate of surface water runoff is increased as water percolation into the soil is reduced (Moench and Fusaro 2012). The potential for surface runoff and debris flows therefore increases for areas recently burned by large wildfires (Moench and Fusaro 2012). As previously discussed and shown in Figure 4.17-4, Fire History, no fires have burned onto the proposed Project site, but multiple wildfires have burned within a 5 mile radius of the proposed Project site. Fires that have burned close to the Project site include the 1979 Niguel Fire, 1979 Ortega Fire, 2016 San Juan Fire, and a small unnamed 2017 fire that occurred on the other side of I-5. The Project site will be located on gravel-covered level land immediately adjacent to Oso Creek, hence there are no structures or people downslope of the proposed Project. There is a 40-foot elevation difference from the Project site to the stream bed below with a bluff in between.

The potential for landslides, runoff, flooding, drainage changes and water quality improvements has been analyzed in Section 4.15, Water Resources, and Section 4.4, Geological Hazards and Resources. While the Project site is not located in SRA or LRA FHSZ and is located on relatively flat land, the Project site is approximately 600 feet east

from where the uphill slopes begin. The Fire Protection Technical Report notes that while a flaming front is possible from the due west approaching the Project in a downhill, backing fire, it is unlikely (Appendix 4.17A). The USGS Post Wildfire Debris Flow Hazard Assessment Viewer uses geospatial data related to basin morphometry, burn severity, soil properties, and rainfall characteristics to estimate the probability and volume of debris flows that may occur in response to a design storm (USGS 2023). The USGS publishes the results of this assessment online on a map viewer that shows recent burn perimeters, and the hazard and the likelihood of a debris flow within the fire perimeter. The likelihood of a debris flow in the Project area is categorized in the 0-20% likelihood in response to a design storm having a 15-minute peak rainfall intensity of 24 mm/h occurring immediately after a wildfire (USGS 2023). Additionally, according to Figure 2-3 in the Landslide and Liquefaction Zones of the Safety Element of the City of San Juan Capistrano General Plan, the proposed Project site is located in an area outside of the City's landslide zone. As described in Section 4.15, Water Resources, the overall site drainage patterns would generally remain the same as existing drainage patterns. Section 4.15 also notes that while a portion of the Project's offsite access road would be located within a Federal Emergency Management Agency (FEMA) 100-year floodplain area, the Project site (BESS area) does not overlap with a FEMA 100-year floodplain area and would not be subject to inundation by a 1% annual chance flood. No wildfires have burned on the site or on the larger parcel that contains the Project site. Any post-fire related runoff or drainage impacts from the project site vicinity would likely follow site stormwater and drainage infrastructure that reduces the natural drainage patterns and flow into Oso Creek. It is unlikely that any people or structures would be impacted by the limited contribution of runoff from the project site vicinity as the creek flows unimpeded south through the cities of San Juan Capistrano and Dana Point into the Pacific Ocean. Further, as discussed in Section 4.4, Geological Hazards and Resources, based on a review of California Geological Survey mapping, the southwest portion of the Project site is partially located within landslide class VII designated area, which is not considered a very high landslide susceptibility area; the remainder of the site is designated in landslide class 0.

In summary, there is not a significant risk of landslides and flooding within the proposed Project area. Therefore, the Project is not anticipated to not expose people or structures to downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes.

4.17.3 Cumulative Effects

Cumulative projects that would have the potential to be considered in a cumulative context with the proposed Project's incremental contribution, and that are included in the analysis of cumulative impacts relative to wildfire, are identified in Chapter 4, Environmental Analysis, Table 4-1, Cumulative Projects. Cumulative projects were chosen based on proximity to the proposed project. Other projects include residential, commercial, and industrial development as well as similar energy projects. The majority of the cumulative projects would involve both construction and operational activities.

As described above, the proposed Project Site is not located in SRA or LRA FHSZ. As with any new project in this location, the proposed Project, combined with other projects in the region, would increase the activities and potential ignition sources in the area, which may increase the potential of a wildfire and increase the number of people and structures exposed to risk of loss, injury, or death from wildfires. Individual projects located within the City of San Juan Capistrano and surrounding areas are required to comply with their applicable County/City fire and building codes, which must be at least as stringent as state codes and have been increasingly strengthened as a result of severe wildfires that have occurred in the last two decades. While the Project is not located in an SRA or Very High FHSZ, the Project will prepare a Fire Protection Plan (FPP) as part of its ERP, using qualified fire safety

specialists to recommend prevention and management practices. Other projects in the vicinity that are located in those zones will need to prepare Fire Protection Plans with extensive analyses as well.

CFC 403.10.6 requires a fire safety and evacuation plan be prepared and maintained for occupancies that involve activities for the research and development, testing, manufacturing, handling, storage of lithium-ion batteries or lithium metal batteries or the repair or servicing of vehicles powered by lithium-ion batteries or lithium metal batteries. This would be the case for most systems as lithium is the most efficient and economically viable of available technologies. This would mean that other energy storage projects would be required to prepare such plans which would aid in highlighting any possible hazards associated with the projects and incorporate any necessary mitigations to reduce those hazards to acceptable levels. Since each project would be expected to adhere to all applicable regulations and, if within an area presenting a fire hazard, would likely be required to prepare a document analyzing the wildfire risks associated with the project, the cumulative effect of the Project and other nearby projects is not considered to exacerbate wildfire risks or expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire due to slope, prevailing winds, or other factors. Therefore, the cumulative effect of the Project and nearby projects on the spread of wildfire is not anticipated to exacerbate wildfire risk.

The proposed Project has associated infrastructure that, combined with the associated infrastructure of other projects in the region, could result in an increase in potential ignition sources in the area, which may increase the potential of a wildfire. However, as mentioned previously mentioned, each project located in an SRA or a Very High FHSZ would be subject to the requirement of the preparation of an FPP which would analyze the fire hazard upon and presented by the respective project as well as its compliance with the most stringent of all applicable local or state regulations. Any mitigations or alternative materials and methods necessary to negate existing hazards would be provided. Similarly, Fire Safety Plans (FSPs) would have to be prepared for the nearby energy storage systems should they choose to utilize lithium battery technology, which is the most common current choice given the current technology available. FPPs and FSPs would analyze projects in their totality, including associated infrastructure. These plans would highlight any fire hazards presented by a project's associated infrastructure and mitigate them as necessary. By these processes reducing the potential of ignition from each respective project, the cumulative impact of said projects is reduced.

Syphard and Keeley (2015) summarized all wildfire ignitions included in the CAL FIRE FRAP database dating back over 100 years. They found that in San Diego County (which is similar to the Orange County fire environment), equipment-caused fires were by far the most numerous, and these also accounted for most of the area burned, but powerline fires were a close second. The equipment related fires would likely be minimized through FPP and FSPs and the findings of the research correlated these fires mainly with low to medium density residential areas where there is an intermix of potential ignition sources, homes, with vegetation that can carry fire. Modern code requirements, including maintained defensible space, would inhibit the spread of fire from such ignitions.

In regard to the environmental impacts of the associated infrastructure, other than those related to wildfire, as stated previously, the installation and maintenance of roads, utilities, vegetation management activities, and any other project-related infrastructure would be part of their associated project. As such, any potential temporary or ongoing environmental impacts related to these components of their respective project would have been accounted for and analyzed through the CEQA process as part of the impact assessment conducted for the entirety of the project.

In summary, while the proposed Project, in combination with other projects in the area, would increase the amount of associated infrastructure that may cause an ignition that could result in a wildfire, the proposed projects located in an SRA or a Very High FHSZ would likely be subject to the preparation of FPPs, FSPs, and/or CEQA documents that would identify and mitigate any hazards presented by the associated infrastructure. Therefore, the cumulative

effect of the associated infrastructure of the proposed Project and associated infrastructure of other projects within the vicinity is not anticipated to exacerbate fire risk.

4.17.4 Recommendations

Extreme Fire Day Ignition Avoidance and Fire Patrols. The National Weather Service defines a Red Flag Warning as environmental conditions where warm temperatures, very low humidities, and stronger winds are expected to combine to produce an increased risk of fire danger. A Red Flag Warning is issued for a stated period by the National Weather Service using pre-determined criteria to identify particularly critical wildfire danger in a particular geographic area. All construction and maintenance activities shall temporarily cease during Red Flag Warnings. The superintendent shall coordinate with personnel to determine which low fire hazard activities may occur. Should OCFA or a similar entity declare a Red Flag Warning affecting the Project site, the same work activity restrictions occurring during National Weather Service Red Flag Warning periods shall apply.

The proposed Project shall implement ongoing fire patrols during the fire season as defined by local and state agencies. The Site Safety Director (SSD) will be assigned as fire patrol to monitor work activities when an activity risk exists for fire compliance. The SSD shall verify proper tools and equipment are on site, assess any fire agency work restrictions, and serve as a lookout for fire starts, including staying behind (e.g., a fire watch) to make certain no residual fire exists. Fire watch may be performed by any site personnel. An SSD shall perform routine patrols of the Project site during the fire season equipped with a portable fire extinguisher and communications equipment. The proposed Project staff shall notify the OCFA of the name and contact information of the current SSD in the event of any change.

Pre-Construction Requirements. Vegetation management shall be conducted prior to the start of construction and throughout all construction phases. Existing flammable vegetation shall be reduced by 50% for all areas within 20 feet of any construction activities. Caution must be used to avoid causing erosion or ground (including slope) instability or water runoff due to vegetation removal, vegetation management, maintenance, landscaping or irrigation.

Prior to bringing any combustible materials onto the site, site improvements within the active development area shall be in place, including an approved, temporary roadway surface. These features shall be approved by OCFA prior to combustibles being brought on site.

Construction Suppression and Monitoring Equipment Requirements. The Project will be equipped with fire suppression and monitoring equipment. The amount and type of equipment will be determined by consultation between Compass Energy Storage LLC, the SSD, and OCFA. Additionally, all construction-related vehicles shall be equipped with a 10 pound, 4A:80BC Dry Chemical Fire Extinguisher, a 5-gallon backpack pump fire extinguisher, a 46-inch round point hardwood shovel, and a first aid kit.

Operational Vegetation Management Requirements The proposed Project will remove all vegetation inside the 10 foot tall perimeter wall. Landscaping outside the wall for visual screening will be limited to a fire resistant planting palate to be approved in the attached Landscape Plan. Inside the wall, a conversion of this area to a rock/gravel surface and establishment of minimum 20-foot wide FMZ within the inside perimeter of the facility are recommended.

As a further means of ensuring the vegetation management is maintained per this requirement, the proposed Project applicant or current owner will obtain an inspection and report from an authorized Wildland Fire Safety Inspector by June 1 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 County.

4.17.5 Laws, Regulations, and Standards

Federal, state, and local laws, ordinances, regulations, and standards (LORS) related to wildfire were reviewed for applicability to the Project. These summarized below in Table 4.17-2 and described in detail.

Table 4.17-2, LORS Applicable to Wildfire and Fire Protection

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
Federal	National Fire Protection Association Codes, Standards, Practices, and Guides	Provides standards for the design, installation, operation and removal of BESS in regard to fire safety.	Section 4.17.5 Appendix 4.17A	The NFPA Standards provide the basis for state regulation (CFC Chapter 12 Section 1207), which the proposed Project will comply with.
Federal	North American Electric Reliability Corporation; Institute of Electrical and Electronics Engineers; National Electrical Safety Code	Electrical components of the proposed Project. Most notably, overhead powerlines.	Section 4.17.5 Appendix 4.17A	All electrical components, most notably overhead powerlines, associated with the proposed Project, would comply with the requirements of these LORS, most notably the vegetation management requirements.
Federal	Federal Wildland Fire Management Policy; National Fire Plan	Policies of fire suppression services provided to the proposed Project.	Section 4.17.5 Appendix 4.17A	These documents impact the policies of the agencies that would provide fire suppression services to the proposed Project.
Federal	International Fire Code; International Wildland–Urban Interface Code	Model codes for California.	Section 4.17.5 Appendix 4.17A	As a model code for the California Fire Code and upcoming Wildland-Urban Interface Code, they impact what requirements are adopted by the State and subsequently County.

Table 4.17-2, LORS Applicable to Wildfire and Fire Protection

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
State	CGC Sections 51175 through 51181; PRC Sections 4292-4293; PUC 8386	LORS pertaining mainly to defensible space, vegetation management around powerlines, and fire hazard severity zones.	Section 4.17.5 Appendix 4.17A	Vegetation management around power lines would be in compliance with these requirements
State	Part 9 of CCR Title 24, California Fire Code	Establishes requirements for fire department access, fire protection systems, BESS design, installation, operation, and removal.	Section 4.17.5 Appendix 4.17A	All Project components will be in compliance with the requirements of the CFC including those pertaining to fire apparatus access, and BESS design.
State	CAL FIRE	The CAL FIRE subdivision, FRAP, creates the FHSZ maps that dictate what FHSZs are near the proposed Project.	Section 4.17.5 Appendix 4.17A	The Project not located in FHSZ nor in an SRA area that would be served by CAL FIRE suppression services and have to comply to all pertinent LORS for development in a SRA. However, FHSZ maps delineate nearby FHSZ lands.
State and Local	Mutual Aid Agreements	Establishes agreements between fire protection agencies to provide aid to nearby areas when necessary.	Section 4.17.5 Appendix 4.17A	Enables fire protection to be provided by the nearest resource and for additional resources to respond when necessary.
Local	OCFA 2023 Strategic Fire Plan; County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan; Unified County of Orange and Orange County Operational Area Emergency Operations Plan	Establishes operational policies and plans for the agencies providing emergency services.	Section 4.17.5 Appendix 4.17A	Impacts the agencies that would provide emergency services to the proposed Project and possible evacuation orders.

Table 4.17-2, LORS Applicable to Wildfire and Fire Protection

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
Local	City of San Juan Capistrano General Plan	Establishes policies that guide fire-safe development and local emergency services.	Section 4.17.5 Appendix 4.17A	Provides general principles that the proposed Project would follow as well as policies that would impact the emergency services that would serve the proposed Project.
Local	City of San Juan Capistrano Municipal Code	Contains the City of San Juan Capistrano Fire Code, which outlines the requirements of the proposed Project pertaining to fire safety.	Section 4.17.5 Appendix 4.17A	Contains pertinent local codes (Fire Electrical), that all proposed Project components would have to be in compliance with.

Acronyms: CCR – California Code of Regulations, CFC – California Fire Code, CGC California Government Code, NFPA – National Fire protection Association, PRC – Public Resource Code, PUC – Public utilities Commission.

4.17.5.1 Federal LORS

National Fire Protection Association Codes, Standards, Practices, and Guides

National Fire Protection Association (NFPA) codes, standards, recommended practices, and guides are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together professionals representing varied viewpoints and interests to achieve consensus on fire and other safety issues. NFPA standards are recommended guidelines and nationally accepted good practices in fire protection but are not laws or codes unless adopted as such or referenced as such by the California Fire Code or the local fire agency.

- **NFPA 10, Standard for Portable Fire Extinguishers (2018):** A long-standing standard, which specifies the types, sizes, rating, and locations for portable fire extinguishers. It also provides information on how to calculate the number and size of portable fire extinguishers needed.
- **NFPA 11, Standard for Low-, Medium-, and High-Expansion Foam (2016):** NFPA 11 is a longstanding standard, which provides recommendations for design and installation of firefighting foam systems and portable equipment. It also provides recommendations regarding calculating the amount of foam concentrate and solution needed on a flammable or combustible liquid fire.
- **NFPA 22, Standard for Water Tanks for Private Fire Protection (2018):** Provides recommendations for the design, construction, installation, and maintenance of tanks and accessory equipment that supply water for private fire protection.
- **NFPA 30, Flammable and Combustible Liquids Code (2018):** This standard provides safeguards to reduce the hazards associated with the storage, use, and handling of flammable and combustible liquids. It provides detailed information regarding tank storage, spacing, dispensing of liquids, portable containers, and other related operations. NFPA 30 is referenced by the California Fire Code.

- **NFPA 70, National Electrical Code (2017):** NFPA 70 is the standard for the design, installation, and inspection of electrical hazards. It includes recommendations for various types of occupancies and also provides recommendations and criteria for the location and installation of "explosion proof" electrical systems.
- **NFPA 72, National Fire Alarm and Signaling Code (2019):** NFPA 72 is the standard for the design, installation, and operation of fire alarm systems in various occupancies. This standard is used by fire alarm system designers when designing and installing a system. It is utilized also by fire agencies when reviewing plans for new systems.
- **NFPA 497, Classification of Flammable Liquids, Gases, or Vapors, and of Hazardous Locations for Electrical Installations in Chemical Process Areas (2017):** NFPA 497 is the standard, which is utilized along with NFPA 70 to determine flammable gas, flammable liquid, and combustible liquid hazards and to recommend the areas that require explosion-proof electrical systems. It also sets forth the extent of the classified areas. Although the title says chemical process areas, it is used as a standard for explosion-proof electrical as it defines various risks and contains numerous diagrams to help the electrical system designer.
- **FPA 855, Standard for the Installation of Stationary Energy Storage Systems,** is the standard for the design, installation, operation, and removal of battery energy storage systems and components. It is the basis for much of CFC Chapter 12 Section 1207.

North American Electric Reliability Corporation

According to NERC Standard FAC-003, transmission vegetation management standards are applicable to all transmission lines operated as 200 kilovolts and higher and to lower voltage lines designated by the Regional Reliability Organization as critical to the reliability of the region's electric system (NERC 2022). The elements and requirements of these standards apply to SDG&E's transmission line–related vegetation management activities in the proposed Project area.

Institute of Electrical and Electronics Engineers

In accordance with Standard 516-2003 (Guide for Maintenance Methods on Energized Power Lines), the transmission vegetation management program requires identifying and documenting clearances between vegetation and any overhead supply conductors while considering transmission line voltage, effects of ambient temperature on conductor sag under maximum design loading, fire risk, line terrain, and elevation, and effects of wind velocities on conductor sway. The clearances identified must be no less than those outlined in this standard.

National Electrical Safety Code

Section 23 of the National Electrical Safety Code describes all clearances, including climbing space involving overhead supply and communication lines.

Federal Wildland Fire Management Policy

The Federal Wildland Fire Management Policy was developed in 1995, updated in 2001, and again in 2009 by the National Wildfire Coordinating Group, a federal multi-agency group that establishes consistent and coordinated fire management policy across multiple federal jurisdictions. An important component of the Federal Wildland Fire Management Policy is the acknowledgement of the essential role of fire in maintaining natural ecosystems. The Federal Wildland Fire Management Policy and its implementation are founded on the following guiding principles,

found in the Guidance for Implementation of Federal Wildland Fire Management Policy (National Wildfire Coordinating Group 2009):

- Firefighter and public safety are the first priority in every fire management activity.
- The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process.
- Fire management plans, programs, and activities support land and resource management plans and their implementation.
- Sound risk management is a foundation for all fire management activities.
- Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives.
- Fire management plans and activities are based upon the best available science.
- Fire management plans and activities incorporate public health and environmental quality considerations.
- Federal, state, tribal, local, interagency, and international coordination and cooperation are essential.
- Standardization of policies and procedures among federal agencies is an ongoing objective.

National Fire Plan

The National Fire Plan, officially titled *Managing the Impacts of Wildfire on Communities and the Environment: A Report to the President in Response to the Wildfires of 2000*, was a presidential directive in 2000 as a response to severe wildland fires that had burned throughout the United States. The National Fire Plan focuses on reducing fire impacts on rural communities and providing assurance for sufficient firefighting capacity in the future. The plan addresses five key points: Firefighting, Rehabilitation, Hazardous Fuels Reduction, Community Assistance, and Accountability. The plan continues to provide invaluable technical, financial, and resource guidance and support for wildland fire management across the United States. The U.S. Forest Service and the Department of the Interior are working to successfully implement the key points outlined in the plan (DOI/USDA 2000).

International Fire Code

Created by the International Code Council, the International Fire Code (IFC) addresses a wide array of conditions hazardous to life and property, including fire, explosions, and hazardous materials handling or usage (although not a federal regulation, but rather the product of the International Code Council). The IFC places an emphasis on prescriptive and performance-based approaches to fire prevention and fire protection systems. Updated every 3 years, the IFC uses a hazards classification system to determine the appropriate measures to be incorporated to protect life and property (often these measures include construction standards and specialized equipment). The IFC uses a permit system (based on hazard classification) to ensure that required measures are instituted (International Code Council 2020a).

International Wildland–Urban Interface Code

The International Wildland–Urban Interface Code is published by the International Code and is a model code addressing wildfire issues in low-density, rural residential areas or where residential areas abut open space (International Code Council 2020b). As of the time of this document being written, California is in the process of consolidating all state codes applicable to the wildland-urban interface into its own Wildland-Urban Interface Code.

4.17.5.2 State LORS

California Government Code

California Government Code Sections 51175 through 51189 provide guidance for classifying lands in California as fire hazard areas and requirements for management of property within those lands. CAL FIRE is responsible for classifying FHSZs based on statewide criteria and makes the information available for public review. Further, local agencies must designate, by ordinance, Very High FHSZs within their jurisdiction based on the recommendations of CAL FIRE. It should be noted that 51182-51189 does not apply to this Project because the Project is not within SRA nor is it located on area classified as FHSZ.

California Code of Regulations

California Fire Code

Part 9 of Title 24 contains the California Fire Code (CFC), which incorporates by adoption the International Fire Code with necessary California amendments. The purpose of this code is to establish the minimum requirements to safeguard the public health, safety, and general welfare from the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises, and to provide safety and assistance to firefighters and emergency responders during emergency operations. Chapter 49 of the CFC contains minimum standards for development in the wildland–urban interface and fire hazard areas. Chapter 12, Section 1207 of the CFC establishes requirements for electrical energy storage systems including allowable quantities and separation distances based upon the type of installation.

California Public Resources Code

California Public Resource Code Section 4292 and 4293 describe the responsibilities of operators of electrical equipment, including distribution and transmission systems, to maintain the flammable vegetation around their equipment and the overhead wires to the following standards:

- Clear a fire break of not less than 10 feet in each direction from the outer circumference of a pole or tower that supports a switch, fuse, transformer, lightning arrester, line junction, or dead end or corner pole,
- Maintain a clearance of the respective distances specified in this section in all directions between all vegetation and all conductors that are carrying electric current:
  - For any line that is operating at 2,400 or more volts but less than 72,000 volts, four feet.
  - For any line operating at 72,000 or more volts but less than 110,000 volts, six feet.
  - For any line operating at 110,000 or more volts, 10 feet.

California Public Utilities Commission General Orders and Rules

- California Public Utilities Commission General Order No. 131-D -The California Public Utilities Commission (CPUC) has sole and exclusive state jurisdiction over the siting and design of the Project. According to CPUC General Order (GO) 131-D, Section XIV.B,
- California Public Utilities Commission General Order No. 95 - General Order 95 (GO 95) describes the overhead line design, construction, and maintenance requirements. GO 95 applies to all overhead electrical supply and communication facilities outside buildings.

- California Public Utilities Commission General Order No. 166 - General Order 166 (GO 166) describes the standards to ensure that jurisdictional electric utilities are prepared for emergencies and disasters to minimize damage and inconvenience to the public that may occur due to electric system failures, major outages, or hazards posed by damage to electric facilities. GO 166 applies to all electric utilities subject to the jurisdiction of the CPUC concerning matters relating to electric service reliability and safety.
- Rule R.08-11-005 - Rule R.08-11-005 describes identifying, evaluating, and adopting fire-safety regulations for the High Fire Threat District (HFTD). R.08-11-005 also adopted the CPUC Fire-Threat Map that describes the High Fire Threat District that consists of three areas: Tier 1 High Hazard Zones, Tier 2 Elevation Risk, and Tier 3 Extreme Risk areas.

Public Utilities Code 8386

Public Utilities Code (PUC) 8386 describes the basic requirements for investor-owned utilities (IOU) towards operating their equipment to minimize the risk of catastrophic wildfire posed by their electrical lines and equipment. PUC 8386 also describes the required elements of a Wildfire Mitigation Plan (WMP) prepared by an IOU, including the wildfire risks, risk drivers present in their service territory, and the strategies the IOU is performing to mitigate these risk/risk drivers.

California Department of Forestry and Fire Protection (CAL FIRE)

CAL FIRE is tasked with reducing wildfire-related impacts and enhancing California's resources. CAL FIRE responds to all types of emergencies including wildland fires and residential/commercial structure fires. In addition, CAL FIRE is responsible for the protection of approximately 31 million acres of private land within the state and, at the local level, is responsible for inspecting defensible space around private residences. CAL FIRE is responsible for enforcing State of California fire safety codes included in the CCR and California Public Resources Codes.

CAL FIRE also inspects utility facilities and makes recommendations regarding improvements in facility design and infrastructure. Joint inspections of facilities by CAL FIRE and the utility owner are recommended by CAL FIRE so that each entity may assess the current state of the facility and the successfully implement fire prevention techniques and policies. Violations of state fire codes discovered during inspections are required to be brought into compliance with the established codes. If a CAL FIRE investigation reveals that a wildfire occurred as a result of a violation of a law or negligence, the responsible party could face criminal and/or misdemeanor charges. In cases where a violation of a law or negligence has occurred, CAL FIRE has established the Civil Cost Recovery Program, which requires parties liable for wildfires to pay for wildfire-related damages.

Fire Hazard Severity Zone Mapping

As previously discussed, CAL FIRE's FRAP database provides data documenting areas of significant fire hazards throughout the state, based on fuel loading, slope, fire history, weather, and other relevant factors as directed by Public Resources Code Sections 4201–4204 and Government Code Sections 51175–51189. FHSZs are ranked from Moderate to Very High and are categorized for fire protection within a Federal Responsibility Area, State Responsibility Area, or Local Responsibility Area under the jurisdiction of a federal agency, CAL FIRE, or local agency, respectively.

California Strategic Fire Plan

The 2019 Strategic Plan is guided by CAL FIRE's mission to serve and safeguard the people and protect the property and resources of California as well as its vision to be the leader in providing fire prevention and protection,

emergency response, and enhancement of natural resource systems. The Strategic Plan is organized into four goals. These goals include to improve core capabilities, enhance internal operations, ensure health and safety, and build an engaged, motivated, and innovative workforce. These goals are further categorized into the following objectives to meet said goals.

- Analyze and integrate core operations functions at all levels of the Department.
- Evaluate and improve existing emergency response capabilities.
- Expand forestry and fire prevention through effective natural resource management programs, education, inspections, and land use planning.
- Strengthen post-incident assessments to create long-term improvements.
- Analyze business support functions and improve operational efficiencies.
- Define and effectively manage internal communication processes.
- Review and update communication processes to all external stakeholders.
- Create a secure, responsive, and integrated user-centric technology culture.
- Manage fiscal challenges to ensure adequate funding for critical programs.
- Promote employee behavioral health and physical fitness.
- Promote the safety of Department employees, partners, and the public.
- Address skill gaps and barriers through creative outreach and recruiting.
- Create and implement detailed training plans for all Department employees.
- Retain the Department workforce through purposeful engagement.

Mutual Aid Agreements

The California Disaster and Civil Defense Master Mutual Aid Agreement, as provided by the California Emergency Services Act, provides statewide mutual aid between and among local jurisdictions and the state. The statewide mutual aid system exists to ensure that adequate resources, facilities, and other supports are provided to jurisdictions whenever resources prove to be inadequate for a given situation. Each jurisdiction controls its own personnel and facilities but can give and receive help whenever needed. CAL FIRE and the OCFA participate in these mutual aid, automatic aid and other agreements with surrounding fire departments. In some instances, the closest available resource may come from another fire department.

4.17.5.3 Local LORS

The proposed Project would be subject to state and federal agency planning documents described above, as well as the regional or local planning documents such as the City of San Juan Capistrano General Plan and the City of San Juan Capistrano Municipal Code.

Orange County Fire Authority, 2023 Strategic Fire Plan

OCFA developed a successor to its 2010–2020 Unity Strategic Fire Plan. Orange County's Unit Strategic Fire Plan was first collaboratively developed as a planning and assessment tool in 2010, in conjunction with key stakeholders and partner organizations, with the goal of reducing total government costs and citizen losses from wildfire in Orange County (OCFA 2023). This plan addresses such topics as firefighter and public safety, Wildland Urban Interface (WUI) challenges, impactful cost-effective solutions, community preparedness, prioritization, collaborative

partnerships, program, project and policy evaluation and adaptability. The plan is now designed to be used in conjunction with both the Orange County Community Wildfire Protection Plan and OCFA's Fire Danger Operating Plan (OCFA 2023).

City of San Juan Capistrano General Plan

Safety Element

The purpose of the Safety Element is to identify potential hazards to the City's jurisdiction including its residents, structures, public facilities, and infrastructure. By identifying local and regional hazards (including both natural hazards and human-made hazards), goals and policies can be crafted to address public safety concerns unique to the City. The Safety Element satisfies the requirements of state planning law and is a mandated component of the General Plan. Government Code Section 65302(g) established the required components of the Safety Element, which includes wildland and urban fires as a main area. State law allows communities to select additional and non-mandatory safety issues for consideration in the Safety Element, and the City has also elected to address utility-related events such as power failure and stoppages. The information in the Safety element serves as a guide for hazard mitigation, emergency planning, and preparedness throughout the City's jurisdiction (City of San Juan Capistrano, 2022). Wildfire policies include the following:

Public Services and Utilities Safety Goal 1: Reduce the risk to the community from hazards related to geologic conditions, seismic activity, wildfires, flooding, and climate change.

Wildfire

Policy 1.1: Ensure that the City Standards for fire protection for new developments in Very High Fire Hazard Severity Zones meet or exceed the statewide minimums.

Policy 1.2: Minimize the approval of new residential subdivision developments in Very High Fire Hazard Severity Zones when feasible.

Policy 1.3: Continue to enforce and, as needed, increase the weed abatement and Arundo removal program on an annual basis.

Policy 1.4: Require property owners to incorporate fire-safe and erosion-safe design during new development or major renovations (development over a two-year period of more than 33% of existing square footage or 2,000 s.f. resulting in the building exceeding 5,000 square feet and receive contracted emergency service agency's approval prior to permit issuance.

Policy 1.5: Coordinate with local contracted fire emergency service agency to evaluate the required fire safe design to be incorporated during rebuilding effort after a major disaster.

Policy 1.6: Reduce the risk of wildfire hazards by requiring fuel modification for landscaping and defensible space for development located in areas of high wildfire risk.

Policy 1.7: Cooperate and coordinate with the OCFA and California Water Service to ensure that fire hydrant placement, water pressure, and availability of fire suppression equipment are adequate for firefighting purposes.

Policy 1.8: Cooperate with the California Water Service to make sure that present and future water supply needs are met adequately.

Policy 1.9: Reduce the risk of erosion and mudslides following wildfires by developing a revegetation / erosion control strategy.

Policy 1.10: Coordinate with Caltrans, Orange County, local contracted emergency service agencies, and City Public Works to maintain defensible space along public and private roads.

Policy 1.11: Coordinate with Cal Fire, and local contracted fire emergency service agency to maintain and create fuel breaks in and around the City.

Policy 1.12: Continue to coordinate with the local contracted fire emergency service agency to determine future emergency needs and required training.

Safety Goal 4: Improve the ability of the City to be prepared for and respond effectively to natural and human-caused emergencies.

Policy 4.1: Support the development of local preparedness plans and ulti-jurisdictional cooperation and communication for emergency situations consistent with the Standardized Emergency Management System (SEMS).

Policy 4.2: Maintain and update the Emergency Operations Plan and Local Hazard Mitigation Plan.

Policy 4.3: Maintain an adequate stock of emergency preparedness equipment and supplies.

Policy 4.4: Educate residents and businesses regarding appropriate actions to safeguard life and property during and immediately after emergencies and encourage them to sign up for an emergency notification system per City's Emergency Preparedness Program.

Public Services and Utilities Element

The purpose of the Public Services and Utilities Element is to ensure that sufficient levels of public services are provided as San Juan Capistrano develops. Working in conjunction with the Growth Management Element, the Public Services and Utilities Element plans for the needed expansion of public services and infrastructure to coincide with new development. Many of the public service provider are agencies or utility providers that operate independently of the City or are contracted by the City to provide services such as law enforcement, fire protection, electrical service, gas service, and telecommunications service. To ensure a sufficient level of public services, the City will work with these agencies or providers to ensure that service to existing residents does not diminish with any future development and the resulting increase in population (City of San Juan Capistrano, 1999).

Public Services and Utilities Goal 2: Work with the Orange County Fire Authority to provide a sufficient level of fire protection.

Policy 2.1: Work closely with the Orange County Fire Authority in determining and meeting community needs for fire protection services and facilities.

Policy 2.2: Periodically evaluate the level of fire protection service to ensure that San Juan Capistrano has appropriate levels of fire protection services.

Public Services and Utilities Goal 7: Work effectively with providers of natural gas, electricity, telephone, cable television and solid waste disposal to provide sufficient levels of these services.

Policy 7.1: Work closely with providers of energy, communications and solid waste disposal in determining and meeting the needs of the community for energy, communications and solid waste disposal.

Policy 7.2: Encourage energy efficient development.

City of San Juan Capistrano Municipal Code

The City of San Juan Capistrano Municipal Code Title 8, Building Regulations, Chapter 10, California Fire Codes, Sec. 8-10.01 adopts the 2022 California Code, based on the 2021 International Fie Code as published by the International Code Council, with amendments.

County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan

The 2020 County of Orange and OCFA Local Hazard Mitigation Plan (LHMP) was developed collaboratively with emergency management staff, County and external partners, and Orange County residents (County of Orange and Orange County Fire Authority 2021). The document is an update to the 2015 LHMP and is a critical step in continuing Orange County's commitment to hazard mitigation as one component of its comprehensive emergency management program. The mission of the LHMP is to promote sound public policy designed to protect residents, critical facilities, infrastructure, key resources, private property, and the environment from natural hazards in unincorporated areas, fire hazards in the Fire Authority service area, and County and Fire Authority owned facilities. The LHMP is a multi-jurisdiction plan developed jointly between the County of Orange, a local government, and the Orange County Fire Authority, a Joint Powers Authority. This collaborative plan was developed to ensure that each participating agency has met the requirements of 44 CFR §201.6. The current approved LHMP is adopted as an element of The County of Orange General Plan under Chapter IX – Safety Element as required under California Government Code §8685.9 and §65302.6. As a multi-jurisdiction plan, the LHMP focuses on mitigating all natural hazards impacting unincorporated areas of the County as well as County and Orange County Fire Authority owned facilities.

Unified County of Orange and Orange County Operational Area Emergency Operations Plan

The Unified County of Orange (County) and Orange County Operational Area (OA) Emergency Operations Plan (EOP) provides guidance and procedures for the County and the County as the OA to prepare for and respond to natural, technological, conflict-related, and human-caused incidents creating situations requiring a coordinated response. It provides guidance for management concepts, identifies organizational structures and relationships and describes responsibilities and functions of the emergency organization to protect life and property (Unified County of Orange and Orange County Operational Area 2019). Of relevance to this Project may be the chapters discussing utility fire and wildland and urban fire.

4.17.6 Agencies and Agency Contacts

Applicable agency contacts for worker health and safety are shown in Table 4.17-3. The project would be designed per OCFA requirements and standards for BESS, however, approval from the OCFA would also be superseded by CEC approval of the Project under the opt-in program.

Table 4.17-3. Permits and Agency Contacts

Issue/Approval	Agency Contact	Applicability
Fire Code Conformance	OCFA Planning and Development Services Section 1 Fire Authority Road, Building A, Irvine, CA 92602 (714) 573-6100	Plan Review

4.17.7 Permits and Permit Schedule

There are no applicable permits or permit schedule. Pending Project approval from the CEC, construction of the Project would commence.

4.17.8 References

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2019 California Fire Code. California Code of Regulations. Title 24, Part 9. Section 1206.2.8.7

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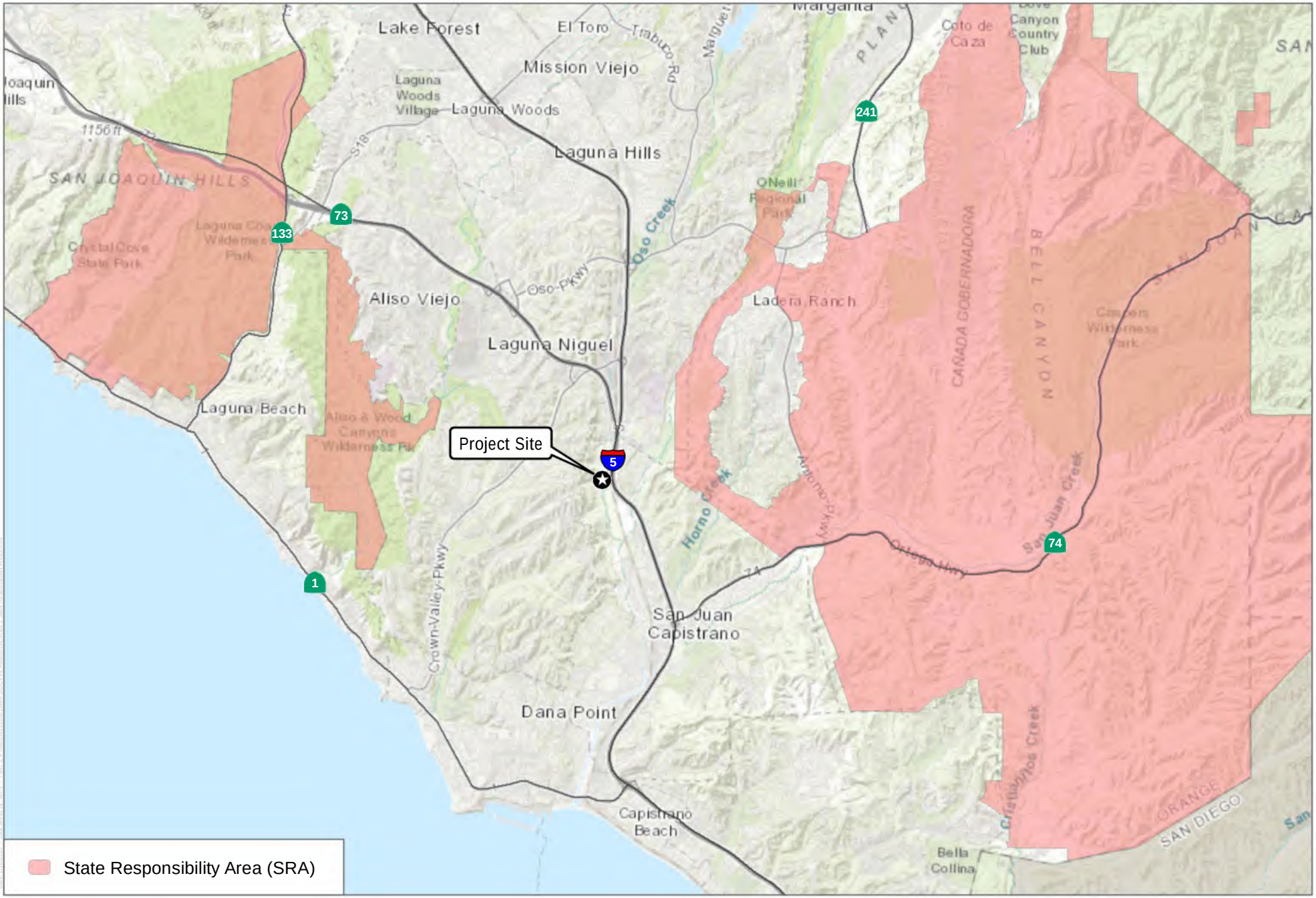
Orange County Fire Authority. Guideline G-10, Stationary Storage Battery Systems. 6 pp.



SOURCE: ESRI IMAGERY 2022

0 1 2 Miles

DUDEK

FIGURE 4.17-1

State Responsibility Areas

Compass BESS Project

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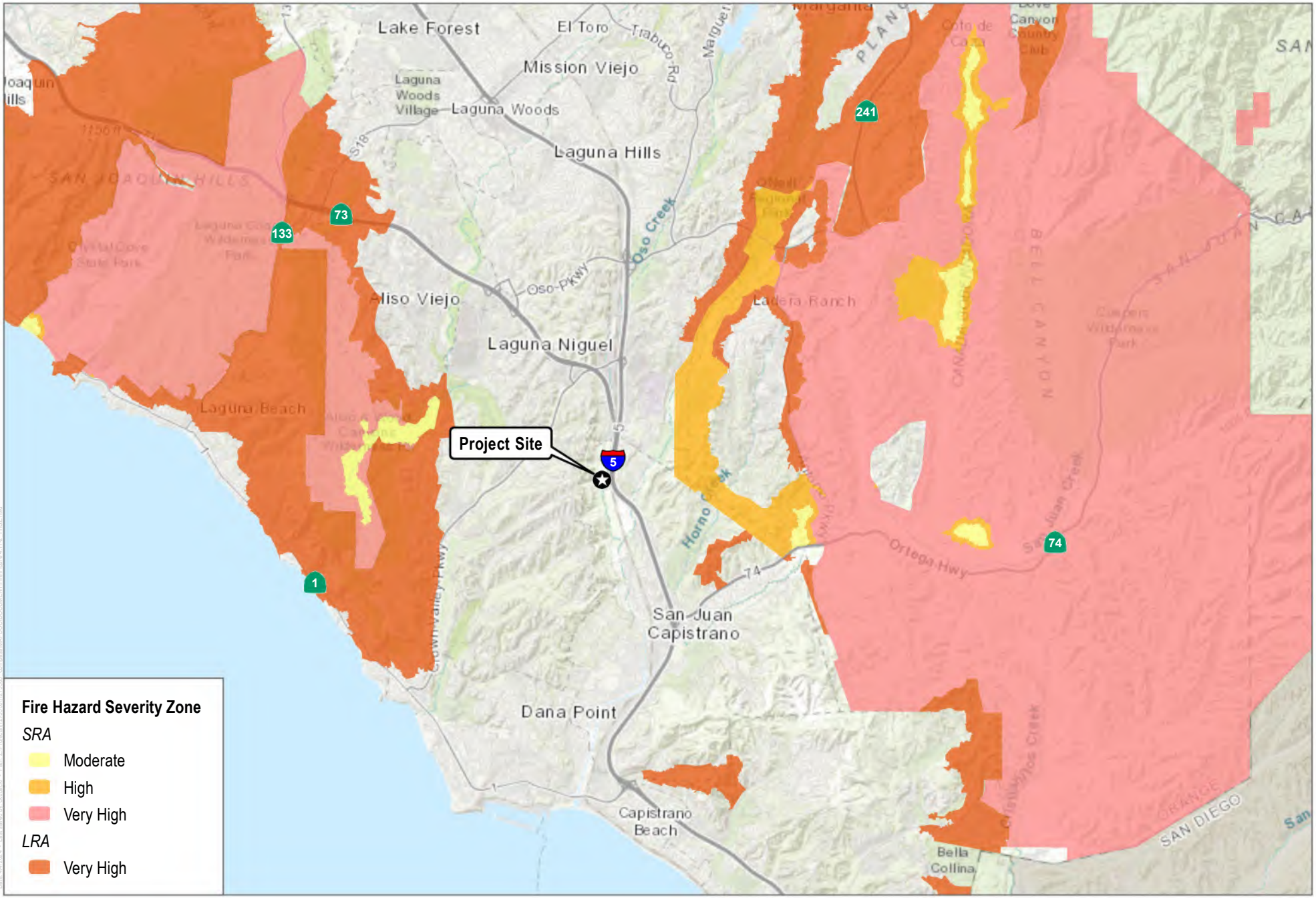

SOURCE: ESRI IMAGERY 2022; CAL FIRE 2011, 2023

0 1 2 Miles

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FIGURE 4.17-2

Fire Hazard Severity Zones (FHSZ)

Compass Energy Storage Project

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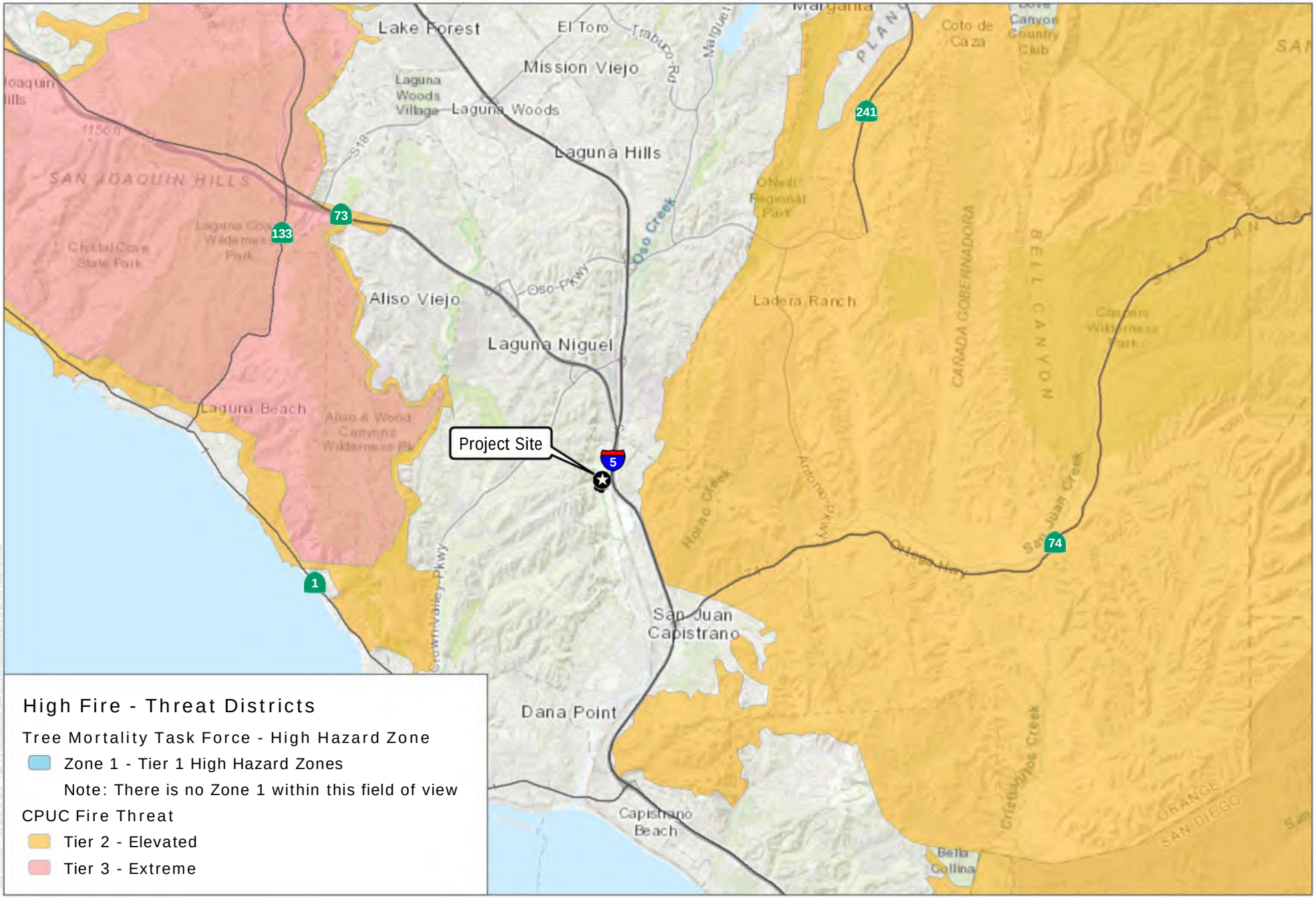

SOURCE: ESRI IMAGERY 2022; CPUC 2022

DUDEK

0 1 2 Miles

FIGURE 4.17-3

CPUC Fire Threat Tiers

Compass BESS Project

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Project Site
5-Mile Buffer
Fire Perimeter

TORO (1950)
GEORGIA SUE (2017)
SOUTH HAMPTON CT (2018)
ALICIA (2018)
(2017)
WOOD (2017)
BLUFF COVE (2018)
TESORO SCHOOL (2017)
ANTONIO (2004)
(2007)
CROWN VALLEY (2007)
STEWARD (1958)
COTO (2018)
TORTOISE (2016)
RIDGE LINE (1994)
OUTSIDE ORIGIN #6 (1961)
NIGUEL (2017)
LAGUNA NIGUEL REGIONAL PARK (2017)
ALISO (2018)
NIGUEL (1979)
ORTEGA (1979)
ANTONIO (2007)
CECIL (2021)
TRABUCO (2016)
WIEGAND (1954)
(2017)
MONARCH (1990)
SAN JUAN (2016)
AVERY (2002)
COASTAL (2022)
HIGHLAND (2020)
COW CAMP (2016)
REATA (2016)
ORTEGA (1988)
CREEK (2018)
SAN JUAN (2016)
(2017)

241
73
133
5
74
1

SOURCE: Esri World Imagery; CAL FIRE 2022

DUDEK

0 1 2 Miles

FIGURE 4.17-4
Fire History
Compass Energy Storage Project

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Table 1. Fire Behavior Modeling Results for Existing Conditions

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
***Scenario 1**: 5% slope, 40 mph N wind (offsite origin approaching proposed project site)*				
Fuel Model GR1 (mowed grass/forbs)	3.1	67	0.5	0.3
***Scenario 2**: 5% slope, 20 mph S wind (offsite origin approaching proposed project site)*				
Fuel Model GR1 (mowed grass/forbs)	2.3	35	0.3	0.2
***Scenario** 3: 30% slope, 40 mph NE wind (onsite origin through adjacent land)*				
Fuel Model GR7 (upland mustard)	61.3	43624	15.0	2.6

Table 2. Fire Behavior Modeling Results for Post-Project Conditions

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
***Scenario 1**: 5% slope, 40 mph N wind (offsite origin approaching perimeter precast wall)*				
Fuel Model GR1 (mowed grass/forbs)	3.1	67	0.5	0.3
***Scenario 2**: 5% slope, 20 mph S wind (offsite origin approaching perimeter precast wall)*				
Fuel Model GR1 (mowed grass/forbs)	2.3	35	0.3	0.2
***Scenario** 3: 30% slope, 40 mph NE wind (onsite origin)*				
Fuel Model GR7 (upland mustard)	61.3	43624	15.0	2.6

Path: Z:\Projects\13.166011\MAPDOC\Fire Addl Items\Figure 4 BehavePlusAnalysisMap.mxd

SOURCE: AERIAL-ESRI IMAGERY SERVICE 2023

DUDEK 0 250 500 Feet

FIGURE 4.17-5
BehavePlus Analysis
Compass BESS Project

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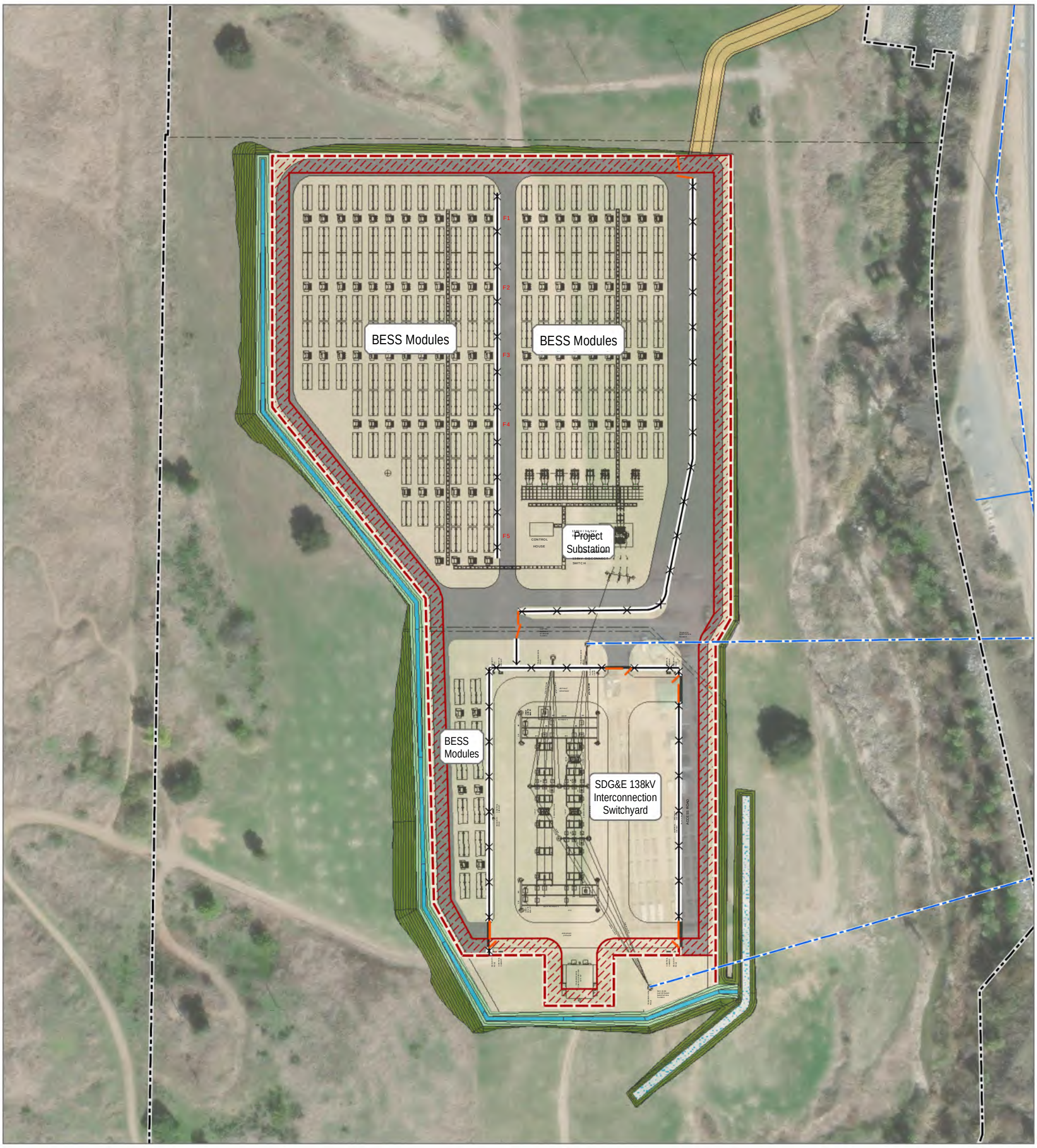

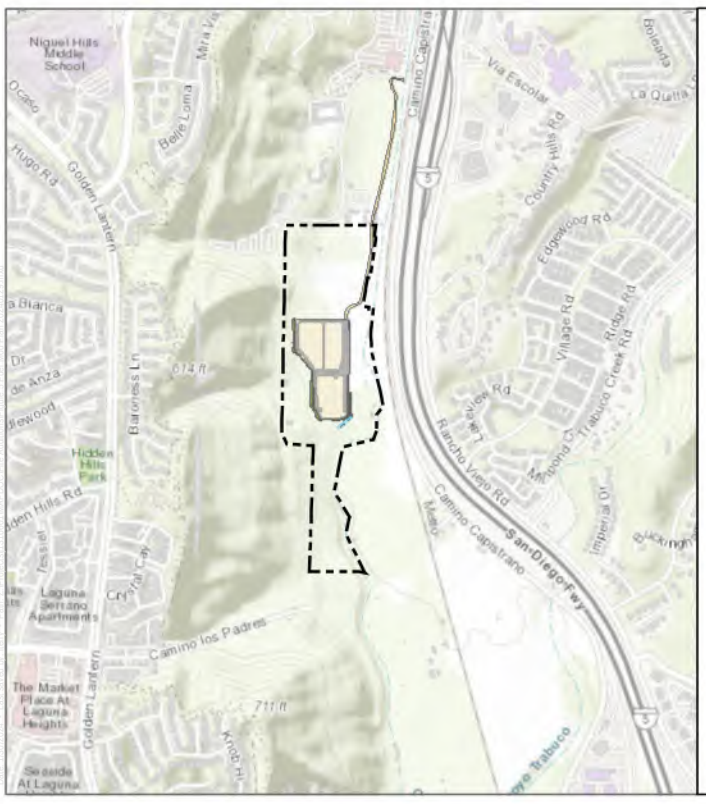

- 10-Ft Precast Fire Wall
- 6-Ft tall Security Fence with 3-strand Barbed Wire
- Gates

ExistingTransmission Alignment

- SDG&E Trabuco to Capistrano transmission line (138kV)
- Fiber
- APN 637-082-71
- 20-Ft Fuel Modification Zone
- Non-combustible Surface/Graded Work
- Internal Access Roads for Emergency Access
- Contour Grading
- Drainage Ditch
- Drainage Side Slopes
- Channel
- Offsite Access Road/Emergency Vehicle Access

FIRE RECOMMENDATIONS:

-Project to be compliant with 2022 CFC 1206, Electrical Energy Storage Systems

-Project to be compliant with OCFA Guideline G-10, Stationary Storage Battery Systems

- Fire suppression systems inside each container as proposed (NFPA 855 compliant)

- 10' tall perimeter precast, decorative concrete walls to OCFA satisfaction

- 20' FMZ - entire area within walls to be void of vegetative fuel - gravel or similar surface

- Landscaped areas to include fire-resistant landscaping consistent with fuel modification zone requirements

- Maintain FMZs twice-yearly or more as needed

- 20' wide access roads per OCFA standards

- Hydrants located per OCFA standards

SOURCE: AERIAL-ESRI IMAGERY SERVICE 2022; SITE PLAN-SARGENT & LUNDY 2024

DUDEK

0 60 120 Feet

FIGURE 4.17-6

Fuel Modification Plan

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Attachment C

Updated Appendix 4.17A Fire Technical Report

Fire Protection Technical Report

Compass Battery Energy Storage System Project

~~**FEBRUARY**~~ **AUGUST 2024**

Prepared for:

ENGIE
(formerly Broad Reach Power)

Prepared by:

DUDEK

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Encinitas, California 92024
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Printed on 30% post-consumer recycled material.

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TABLES

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APPENDICES

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
AC	Alternating current
APN	Assessor's Parcel Number
BESS	battery energy storage system
BMS	Battery management system
BTU	British Thermal Units
CAISO	California Independent System Operator
CFC	California Fire Code
DC	Direct current
ESS	Energy storage system
FMZ	Fuel modification zone
HVAC	Heating, ventilation and air conditioning
kV	Kilo volt
Mph	Miles per hour
MV	medium voltage
MW	Mega watt
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Prevention Association
OCFA	Orange County Fire Authority
PCS	Power Conditioning System
SCADA	supervisory control and data acquisition
SDG&E	San Diego Gas and Electric
UL	Underwriters Laboratory
UPRR	Union Pacific Railroad

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1 Project Description

1.1 Project Location

The Project site is located in the northern portion of the City of San Juan Capistrano, adjacent to Camino Capistrano with Interstate-5 located to the east. The Project site is adjacent to the Saddleback Church Rancho Capistrano to the north and currently used by the church for various ancillary activities. The land uses to the south are primarily Oso Creek and open space to the south and east, Union Pacific Railroad and Interstate-5 to the east, and open space and residences outside of the City limits to the west.

1.2 Project Description

The Project will include the development of an approximately 250-1000 MW battery energy storage system (BESS) and associated infrastructure within a development area totaling approximately 12.4 acres within a 40.8-acre parcel owned by the Saddleback Church (Parcel B1 of APN 637-082-71). The proposed Project also consists of an offsite access road comprising approximately 1.6 acres, for a total of 14 acres.

A BESS is stationary equipment that receives electrical energy and then utilizes batteries to store that energy to supply electrical energy at a future time. Power released or captured by the proposed Project will be transferred to and from the SDG&E Trabuco to Capistrano 138kV transmission line via a loop-in generation transmission line that will interconnect to a SDG&E switchyard that will be constructed within the Project site. The Project will consist of lithium-iron phosphate, or similar technology batteries, installed in racks and contained inside non-habitable enclosures; inverters; medium voltage (MV) transformers; a SDG&E switchyard; a project substation; and other associated equipment.

In addition to the BESS, the Project will include the following components, which are described in more detail following the bulleted list:

- Battery Energy Storage System: Lithium-iron phosphate, or similar technology cells form the core of the battery energy storage system. The cells are the basic functional electrochemical unit containing an assembly of electrodes, electrolyte, separators, container, and terminals. Cells are the source of electrical energy by direct conversion of chemical energy, and they would be installed on racks and enclosed in either prefabricated or site-built, non-habitable enclosure. Compass Energy Storage LLC will use battery storage systems that are NFPA 855 Standard compliant, and UL certified that include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. A fire protection system will be installed to automatically shut down any affected battery storage components and prevent the spread of fire to the other battery storage modules.
- Power Inverters and Transformers: The battery cells operate on direct current (DC), while the electric grid uses alternating current (AC). Inverters will be installed to convert AC to DC when the energy is transferred from the grid to the battery and from DC to AC when the energy is transferred from the battery to the grid. Transformers step up the electrical voltage between the battery cells and the grid. The inverters and transformers will be located on concrete pads adjacent to the battery enclosures.
- Project Substation: A project substation will be installed that will include open rack, air insulated switch gear and the main power transformer to step up from 34.5 kilovolts (kV) to 138 kV.

- **SDG&E Switchyard:** A SDG&E switchyard will be installed adjacent to the project substation that will include open rack, air insulated switch gear and the main power transformer to deliver power to the nearby Trabuco to Capistrano 138kV transmission line.
- **Telecommunication Facilities:** Telecommunication equipment, including underground fiber optics or supervisory control and data acquisition (SCADA), will be installed to remotely manage and monitor communication between the BESS and the electrical grid.
- **Perimeter Wall:** A perimeter wall will be constructed that consists of a pre-fabricated decorative wall that will be utilized for both visual enhancement and fire protection.
- **Water Detention Basins:** To meet regulatory standards and reduce potential for stormwater to be discharged off site in exceedance of existing conditions, off site and on site will flow to on-site water detention structures and pumped to existing outfalls which flow into the channelized portion of Oso Creek owned and maintained by Orange County Flood Control District (OCFCD). A waterline will be constructed from the water detention structures to the existing outfalls.
- **Landscaping:** The Project will incorporate landscaping around the perimeter walls as included on the preliminary landscaping plans.
- **Site Access and Security:** On-site access driveways, perimeter precast walls, and nighttime directional lighting will be provided for the project. An access road for construction and operation will be developed from the church property northern entrance that will extend south along the parcel's eastern boundary to the main project entrance as shown in the project engineering plans.
- **Loop-In Transmission Line:** A 138 kV loop-in transmission line will be constructed to transfer power between the SDG&E Trabuco to Capistrano 138kV transmission line and the SDG&E switchyard constructed on site.

The facilities will be remotely operated year-round and be available to receive or deliver energy through the existing adjacent Trabuco to Capistrano 138kV transmission line. 24 hours a day and 365 days a year. After commissioning and during the operational life of the Project, qualified technicians would routinely inspect the battery energy storage system and conduct necessary maintenance to ensure safe operational readiness. If an issue arises, the system can remotely shut down and de-energized.

Battery Energy Storage System Enclosures

The lithium-iron phosphate batteries (LFP) will be housed in non-flammable steel cabinets which contain racks similar to common computer server racks. The racks are typically made of aluminum, but sometimes may be composed of steel. The LFP technology is considered one of the safest, best understood, and most efficient methods of energy storage on the market. The proposed facility will use a LFP technology that has a long lifespan and boasts superior safety and stability characteristics. The battery cabinets and racks will be designed and installed in accordance with the local seismic design requirements.

The battery racks will be housed in non-habitable steel enclosures. The BESS will be designed and installed in conformance with the nationally recognized National Fire Protection Association (NFPA) 855 Standard for the Installation of Stationary Energy Storage Systems, along with all applicable state and City fire protection requirements. The BESS development area will be connected with an improved access road that will meet Orange County Fire Authority (OCFA) requirements. Future augmentation will be located within the BESS yard.

A Battery Management System (BMS) is used in conjunction with the energy storage system (ESS), which can monitor the battery voltage, current, temperature, managing energy absorption and release, thermal management,

low voltage power supply, high voltage security monitoring, fault diagnosis and management, external communication with Power Conditioning System (PCS) and Emergency Management System (EMS), and ensure the stable operation of the energy storage system.

The Project will use battery storage systems that are compliant with NFPA 855, that are Underwriters Laboratories (UL) certified, and that include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. A fire protection system is installed to automatically shut down any affected battery storage components and prevent the spread of the fire to the other battery storage modules. ~~Included in the BESS are the fire suppression system (FSS) and the heating, ventilation, and air conditioning (HVAC) system. The FSS system is composed of smoke detectors, gas detectors and aerosols, which serve the primary purpose of preventing fire spread should any open flame or gas signal appear in the battery system. The HVAC system is essentially liquid cooling, with the main function of maintaining the temperature of the battery system within the allowable operating temperature range. An auxiliary distribution box will also be included which provides auxiliary power for the whole control system and liquid cooling system~~. In addition, the site will include infra-red sensors and visual monitoring by the operations team as part of its Hazard Mitigation and Emergency Response program.

A 10-foot-tall masonry perimeter wall will be constructed that consists of prefabricated concrete that will be utilized for both visual enhancement and fire protection. This wall will be combined with perimeter landscaping to minimize or eliminate visual impacts from public views.

Fire Protection System

Compass Energy Storage, LLC will use battery storage systems that are NFPA 855 Standard compliant, and UL certified that include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. A fire protection system will be installed to automatically shut down any affected battery storage components and prevent the spread of fire to other battery storage modules. The installation will also be compliant with 2022 CFC 1206 regarding installation of outdoor systems (see Appendix A).

The LFP batteries utilized are certified and listed to national and international product safety standards from entities such as Underwriter's Laboratories (UL) and the International Electrotechnical Commission (IEC).

These certifications include, but are not limited to:

- UL 1642: This certification standard is applicable to secondary (rechargeable) lithium-ion cells and batteries used as a power source (such as BESS). The standard's requirements are intended to reduce the risk of fire or explosion when the battery is used in a product. For example, the standard subjects lithium-ion batteries to severe abuse conditions and evaluates if they can safely withstand them.
- UL 1973: This certification standard is applicable to batteries and battery systems utilized for energy storage. The standard evaluates the battery system's ability to safely withstand simulated abuse conditions. For example, the standard subjects module-level stationary batteries to an internal fire exposure test to force a thermal runaway in one cell to ensure it does not explode, propagate fire to neighboring cells, or propagate to the rest of the modular battery system. UL 1973 applies to stationary BESS applications, such as photovoltaic installations and wind turbine energy storage systems, as well as other specialized energy storage systems, such as light electric rail (LER) operations.
- IEC 62619: This safety standard specifies requirements and tests to ensure the safe operation of secondary (rechargeable) lithium-ion cells and batteries used in ESS and in other industrial applications. Electrical

safety is covered under Clause 8 of the standard, which requires the completion of a risk analysis to determine specific electrical safety issues associated with the intended use of a given battery system or device.

The batteries are also certified, tested, and listed to national and international product safety standards and test methods, including, but not limited to:

- IEC 62933-5-2: This safety standard addresses various aspects of BESS, including the requirements for grid-integrated BESS.
- UL 9540: This standard covers energy storage systems (including lithium-ion BESS) for stationary indoor and outdoor installations and establishes the system-level certification for energy storage systems and its associated equipment.
- UL 9540A: The test methodology evaluates the fire characteristics and thermal runaway fire propagation of a BESS (including lithium-ion BESS). The test method provides a means to evaluate thermal runaway and fire propagation at the cell level, module level, and unit level. The data generated from the test method can be used to determine the fire and explosion protection required for a BESS installation based on fire test data. This test is specifically referenced by the IFC, NFPA 1 and 855 to demonstrate the functionality of the BESS fire protection features during large-scale fire testing.

The batteries also meet all the regulatory installation level codes and standards for a BESS when it is installed These regulatory codes and standards include the CFC and NFPA 855. The perimeter wall discussed above (10 feet tall, see Appendix B) will also serve for fire protection purposes – both to prevent wildfire from impacting the site and to reduce the chance of an on-site fire from escaping beyond the property. BESS containers will also be set back approximately 20 feet from the perimeter wall to provide an added internal buffer for prevention, protection and management.

Typically, a FSS system is composed of smoke detectors, gas detectors and aerosols, which serve the primary purpose of preventing fire spread in time should any open flame or gas signal appear in the battery system. The Tesla Megapack 2XL, or MP2XL, does not utilize this type of suppression mechanism due to its unique and improved safety design, and instead uses a built-in failsafe fire protection system to automatically shut down any affected battery storage components and prevent the spread of the fire to the other battery storage modules, that are compliant with National Fire Protection Association (NFPA) 855 and Underwriters Laboratories (UL) certified.

The Tesla Megapack 2XL also includes an explosion control system to mitigate the risk of an uncontrolled deflagration. The system includes 26 pressure-sensitive vents (overpressure vents) and 12 sparkers installed throughout the battery module bay designed to ignite flammable gases very early in a thermal runaway event before they accumulate within the enclosure and become an explosion hazard. The sparkers are installed at a variety of locations and heights throughout the battery module bay to ensure the flammable gases released during thermal runaway quickly meet an ignition source. The 26 overpressure vents are installed in the roof of the sealed battery module bay's IP66 enclosure and permit gases, products of combustion, and flames to safely exhaust through the roof during a thermal event. By designing this natural ventilation flow path, flammable gases are not permitted to accumulate within the MP2XL cabinet, reducing the risk of an explosion that could compromise the cabinet's integrity, push open the front doors, or expel projectiles from the cabinet. In addition, the ventilation path creates a controlled fire condition, should one occur, out the front and top of the MP2XL cabinet. By maintaining the cabinet's integrity, keeping all the doors shut during a fire event, reducing the risk of projectiles, and creating a

controlled path for flames that exit the top of the MP2XL cabinet, the likelihood of a thermal event having an impact on life or safety of site personnel or first responders is reduced. In addition, by maintaining these features, the likelihood of a fire propagating to electrical equipment or other exposures is also reduced and can be designed for at the installation level (i.e., maintain clearances, emergency response plans, etc.).

The number and total area of overpressure vents is sized following the requirements of NFPA 68. They are designed to relieve with a safety factor of 2.5 times the enclosure's strength, including the front doors. Meaning, during an overpressure event inside the MP2XL cabinet, the overpressure vents will open when subjected to an overpressure of approximately 12 kilopascal (kPa) (250 pounds per square foot [psf]), well before the integrity of the enclosure itself becomes compromised at 30 kPa (626 psf) with a 2.5 times safety factor.

Tesla developed the overpressure vents and sparker system because the application of NFPA 68 or NFPA 69 was not suitable for the MP2XL cabinet given it does not have large volumes of open space, as is typical of BESS cabinets. This engineered approach is permitted by NFPA 855, Section 9.6.5.6.4, provided it is validated through large-scale, unit level fire testing, which Tesla has performed. During the UL 9540A unit level test, six cells were simultaneously forced into thermal runaway within a single battery module. This resulted in thermal runaway propagating to a seventh cell only. The failure of the seven cells did not result in any observations of explosion hazards, including but not limited to, observations of a deflagration, projectiles, flying debris, detonation, or other explosive discharge of gases. In addition, internal destructive unit level fire testing further demonstrated the functionality of the explosion control system. During this test, 48 cells were simultaneously failed within the same battery module (an extreme abuse condition). The sparker system ignited the flammable off-gases and an overpressure vent opened. This resulted in a controlled fire event. There were no observations of explosion hazards, such as projectiles, flying debris, detonation, or other explosive discharge of gases.

The Orange County Fire Authority (the authority having jurisdiction) will have review and approval rights for the facility fire protection and management ~~suppression~~ plans and the project HMA and ERP will be developed in coordination with the OCFA. The review/approval by the authority having jurisdiction will cover all applicable design, construction, and testing requirements of the NFPA 855 Standard.

Loop-In Transmission Line

A loop-in transmission line will be constructed that will transfer power to and from the proposed project and the SDG&E Trabuco to Capistrano 138kV transmission line approximately 500 feet to the east of the project site, running north-south adjacent to the railroad. The loop-in transmission line will be supported by up to 5 pole structures which will be sited to fully avoid Oso Creek.

Outdoor Electrical Equipment

MV transformers and additional electrical equipment will be installed outside the BESS enclosure. The collector substation will be located within the Project site. Components will include a main power transformer, control house, and switchgear. Underground wires and cabling will run from the battery cable collection box to a concrete pad housing the inverter and transformer. From the MV transformer, cabling will be run to the collector substation. All outside electrical equipment will be housed in the appropriate National Electrical Manufacturers Association (NEMA) rated enclosures and screened from view, to the extent possible, on all sides.

Inverters

Compass Energy Storage, LLC uses only industry-standard, nationally (and internationally) recognized equipment. These inverters are stand-alone units that operate in all conditions inside the BESS yard. They operate in both a charge mode and a discharge mode. There will be on-site disconnects which may be used in the event of an emergency or unscheduled maintenance.

Telecommunication Facilities

The Project will include telecommunication facilities for communication with the SDG&E/CAISO facilities and to support remote Project operations monitoring. To provide for communication with SDG&E facilities, a fiber-optic cable will be used to connect the Project site switchyard with the SDG&E point of interconnection. Utility interconnection regulations require the installation of a second, separate, redundant fiber-optic cable. The redundant fiber-optic cable will also be installed within the Project footprint. For remote monitoring and operations communication, the Project will use local exchange carrier services, connecting to existing telecommunication fiber-optic lines owned and managed by local telecommunication providers.

Site Access and Security

Interstate-5 is the largest highway in the area and provides regional access to the Project site from the north and south. Access to the Project site will be provided via an existing access road off of Camino Capistrano approximately 0.6 miles northeast of the Project site. Existing agricultural roads will be improved from the entry access road off Camino Capistrano along the east side of the property to the Project site. Road improvements shall consist of converting dirt roads into gravel roads and widening the roads to meet OCFA and SDG&E standards (30-feet wide).

As noted above, precast walls will be installed around the perimeter of the Project site for safety and security purposes as well as for visual screening. Access will only be available to authorized personnel. A Knox box will be provided at all access gates to allow for emergency access. Permanent motion-sensitive, directional security lights will be installed to provide adequate illumination around the substation area and points of ingress/egress. All lighting will be shielded and directed downward to minimize the potential for glare or spillover onto adjacent properties. Security cameras will be placed on site and monitored 7 days a week and 24 hours per day.

1.3 Fire Environment

1.3.1 Fire Risk Setting

The Project site is not located within a State Responsibility Area (SRA) or Local Responsibility Area (LRA) Very High Fire Hazard Severity Zone. The closest SRA/VHFHSZ to the east is across the I-5 Freeway in the Mission Viejo area, about one mile from the project site. To the west the closest SRA/VHFHSZ is west of Laguna Niguel about 2.5 miles from the project site (see Figures 1 and 2). Neither is the Project located within a California Public Utilities Commission (CPUC) High Fire Threat District. The closest districts are about ½ mile to the east and two miles to the west (see Figure 3).

2 Fire Behavior Analysis

2.1 Fire Scenario Assessment

Because of the site and topography, scenario runs from off-site have been limited to wildfire approaching from the north or south in alignment with the Oso Creek stream channel which would likely dominate wind patterns and fire behavior in the area. To the east is the railroad, Camino Capistrano and I-5 Freeway. To the west are uphill slopes (up and away from the project to the west) with residential development on the bluffs above. While a flaming front is possible from the due west approaching the Project in a downhill, backing fire, it is unlikely. A flaming front from the due east out of the stream channel also seems unlikely based on the limited fuel sources.

An on-site run scenario was included from an on-site fire ignition with a flaming front moving to the southwest uphill from the site on the adjacent slope. See Figure 4 for Fire Behavior Map.

- Scenario 1. Fire flaming front approaching the Project site from agricultural land to the north driven by northern winds (offshore conditions), burning through mowed grass and forbs approaching the recommended perimeter walls surrounding the site.
- Scenario 2. Fire flaming front approaching the Project site from the agricultural land, upland mustards and riverine vegetation to the south driven by southern winds (onshore conditions), burning through mowed grass and forbs approaching the recommended perimeter walls surrounding the site.
- Scenario 3. Fire flaming front approaching adjacent lands to the southwest from the Project site driven by northeastern winds (offshore conditions), burning through upland mustard vegetation through the adjacent open space.

2.2 Fire Behavior Modeling

As presented in Table 1, wildfire behavior in upland mustard fuel beds, presented as Fuel Model GR7, represents the most extreme conditions in Scenario 3 (on-site origin moving away from Project towards adjacent lands), significantly affected by the steep 30% uphill slope. In this case, flame lengths are calculated to reach 61.3 feet with 40 mph northeast winds; spread rates reach 15 mph. The spotting distance, where airborne embers can ignite new fires downwind of the initial fire, is calculated at 2.6 miles. [*Note: In Scenario 3 the fire front would be moving away from the project site and onto the adjacent open space lands, hence the extreme calculated flame lengths. The slope gradient and vegetation changes further uphill resulting in reduced fire front conditions.]* In comparison, a mowed grass/forb fuel type in Scenario 1 (off-site origin moving towards Project) could generate flame lengths up to 3.1 feet high with a spread rate of 0.5 mph. The fire could potentially be spotting for a distance of 0.3 mile. Even though the northeast winds are modeled at 40 mph, the level terrain and maintained vegetation tempers the anticipated wildfire behavior.

Table 1. Fire Behavior Modeling Results for Existing Conditions

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
Scenario 1: 5% slope, 40 mph N wind (off-site origin approaching proposed project site)				
Fuel Model GR1 (mowed grass/forbs)	3.1	67	0.5	0.3
Scenario 2: 5% slope, 20 mph S wind (off-site origin approaching proposed project site)				
Fuel Model GR1 (mowed grass/forbs)	2.3	35	0.3	0.2
Scenario 3: 30% slope, 40 mph NE wind (on-site origin through adjacent land)				
Fuel Model GR7 (upland mustard)	61.3	43624	15.0	2.6

As presented in Table 2, Dudek conducted modeling of the site for post-development fuel modification recommendations. Fuel modification recommendations include irrigated landscaping where applicable, precast concrete walls on the periphery of the proposed project site, a gravel base within the interior of the facility with no vegetation or combustible materials and a 20' wide FMZ around the inside of the perimeter. The existing fuel model assignments were re-classified for each scenario to reflect the fuel modification recommendations.

Figure 5 presents the proposed fuel modification plan and the location of the perimeter walls. The FMZ areas would experience a reduction in flame length and intensity. The 10' tall precast concrete perimeter walls are not combustible and would significantly reduce the radiant heat and potential flame impingement from impacting the project. More importantly, the precast concrete walls would limit the possibility of an on-site fire from generating enough heat to ignite the nearest unmaintained vegetation. The walls would absorb and deflect heat and represent an important fire safety measure for preventing project-caused wildfires.

Table 2. Fire Behavior Modeling Results for Post-Project Conditions

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
Scenario 1: 5% slope, 40 mph N wind (off-site origin approaching perimeter precast wall)				
Fuel Model GR1 (mowed grass/forbs)	3.1	67	0.5	0.3
Scenario 2: 5% slope, 20 mph S wind (off-site origin approaching perimeter precast wall)				
Fuel Model GR1 (mowed grass/forbs)	2.3	35	0.3	0.2
Scenario 3: 30% slope, 40 mph NE wind (on-site origin)				
Fuel Model GR7 (upland mustard)	61.3	43624	15.0	2.6

The results presented in Tables 1 and 2 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 previously mentioned, Dudek conducted modeling of the site for post-fuel modification zones. Typical fuel modification includes establishment of minimum 20-foot wide FMZ within the inside perimeter of the facility along with a 10' tall precast concrete perimeter wall. For modeling the post-FMZ treatment condition, the fuel model assignment was re-classified according to the proposed fuels management treatment.

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3 Discussion

The following section addresses basic Project related potential impact questions that must be evaluated and provided a Project-specific response.

A. Project potential influence on local emergency response/evacuation plans

Local emergency response or evacuation plans and a description of how the proposed project could influence their effectiveness.

The Project would not be expected to impact local emergency evacuation plans. The Project does not include on-site personnel on a daily basis which results in zero or a very low number of vehicles that would be evacuating the area during a wildfire event. Emergency Response plans will need to be updated to document the presence of the BESS at this location along with BESS firefighting strategies, which are already part of the local fire authority's response training and preparedness for other BESS facilities within its jurisdiction. The project will also develop a site specific Hazard Mitigation Analysis (HMA) and Emergency Response Plan (ERP) in coordination with the OCFA. Therefore, the anticipated influence on emergency response plans is anticipated to be minimal.

B. Containment of potential pollutants on site during a wildfire

Discuss how potential project pollutants could be contained on site during a wildfire event.

Potential pollutants generated in the event of a wildfire would be contained within the on-site battery enclosures as described in Section 1 above. The enclosures are NFPA Standard 855 compliant and ~~.~~ include built-in failsafe and cooling systems designed to prevent thermal runaway and the spread of fire. A fire protection system is installed to automatically shut down any affected battery storage components and prevent the spread of the fire to the other battery storage modules ~~are equipped with a fire extinguishing system to ensure fire safety~~. If potential pollutants are able to escape the enclosures, they will be in the form of flammable gases as the vast majority of the BESS systems is non-combustible. The amount of flammable gases are nominal in quantity, will dissipate to an insignificant level within a short distance of the enclosure and the non-combustible perimeter wall will serve as an additional method of containment.

C. Infrastructure built/maintained that may exacerbate the risk of wildfire

Describe infrastructure that would be built or maintained (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate the risk of wildfire.

The infrastructure built or maintained on site includes roads, fuel breaks, emergency water sources, power lines and substation. The roads, fuel breaks and water sources will all contribute to reducing or mitigating the risk of wildfire. The roads will improve access to and egress from the site in the event of an emergency. The fuel breaks will reduce the potential for wildland fire to impact the site and escape from the site. The water sources will provide water for the fire department to help extinguish an approaching wildfire and protect the project site. The site will also contain infrared cameras for heat monitoring.

The power lines, substation and related infrastructure may exacerbate the risk of wildfire. Recent legislation and mitigation efforts on behalf of electric utilities companies have improved the reliability of overhead power

transmission lines and substation. In conjunction with the site's fire safety and overall mitigation efforts the potential impacts on wildland fire will be significantly reduced.

D. People/structures that may be impacted from post-fire flooding or landslides

Describe people or structures downslope or downstream of the proposed project that could be impacted by flooding or landslides, as a result of runoff, post-fire slope instability, or drainage change.

The project site will be located on gravel-covered, level land immediately adjacent to Oso Creek, hence there are no structures or people downslope of the proposed project. There is a 40-foot elevation difference from the project site to the stream bed below with a bluff in between. A concrete perimeter wall, drainage infrastructure and setbacks will further secure the site from potential erosion or landslides (see Section 1).

Any post-fire related runoff or drainage impacts from the project site vicinity would likely follow the natural drainage patterns and utilize installed stormwater management infrastructure, and eventually and flow into Oso Creek. It is unlikely that any people or structures would be impacted by the limited contribution of runoff from the project site vicinity as the creek flows unimpeded south through the cities of San Juan Capistrano and Dana Point into the Pacific Ocean.

4 Recommendations

The following recommendations are provided based on an evaluation of the proposed project and the fire environment at the project location.

- Project to be compliant with 2022 CFC 1206, Electrical Energy Storage Systems (Attachment 1)
- Project to be compliant with OCFA Guideline G-10, Stationary Storage Battery Systems (Stationary Lead-Acid Battery Systems (ocfa.org)
- Battery technology that is compliant with NFPA 855 and UL certified.
- ~~Fire suppression systems inside each container as proposed (NFPA 855 Standard compliant)~~
- 20' FMZ – entire area within walls to be void of vegetative fuel – gravel or similar surface.
- 10' tall perimeter precast, decorative concrete walls to OCFA satisfaction (Attachment 2)
- Landscaped areas to include fire-resistant landscaping consistent with fuel modification zone requirements
- Maintain FMZs twice-yearly or more as needed
- 20' wide access roads per OCFA standards
- Hydrants located per OCFA standards

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5 References

2019 California Fire Code. California Code of Regulations. Title 24, Part 9. Section 1206.2.8.7

National Fire Protection Association. 2021. Guideline 855 - Standard for the Installation of Stationary Energy Storage Systems.

Orange County Fire Authority. Guideline G-10, Stationary Storage Battery Systems. 6 pp.

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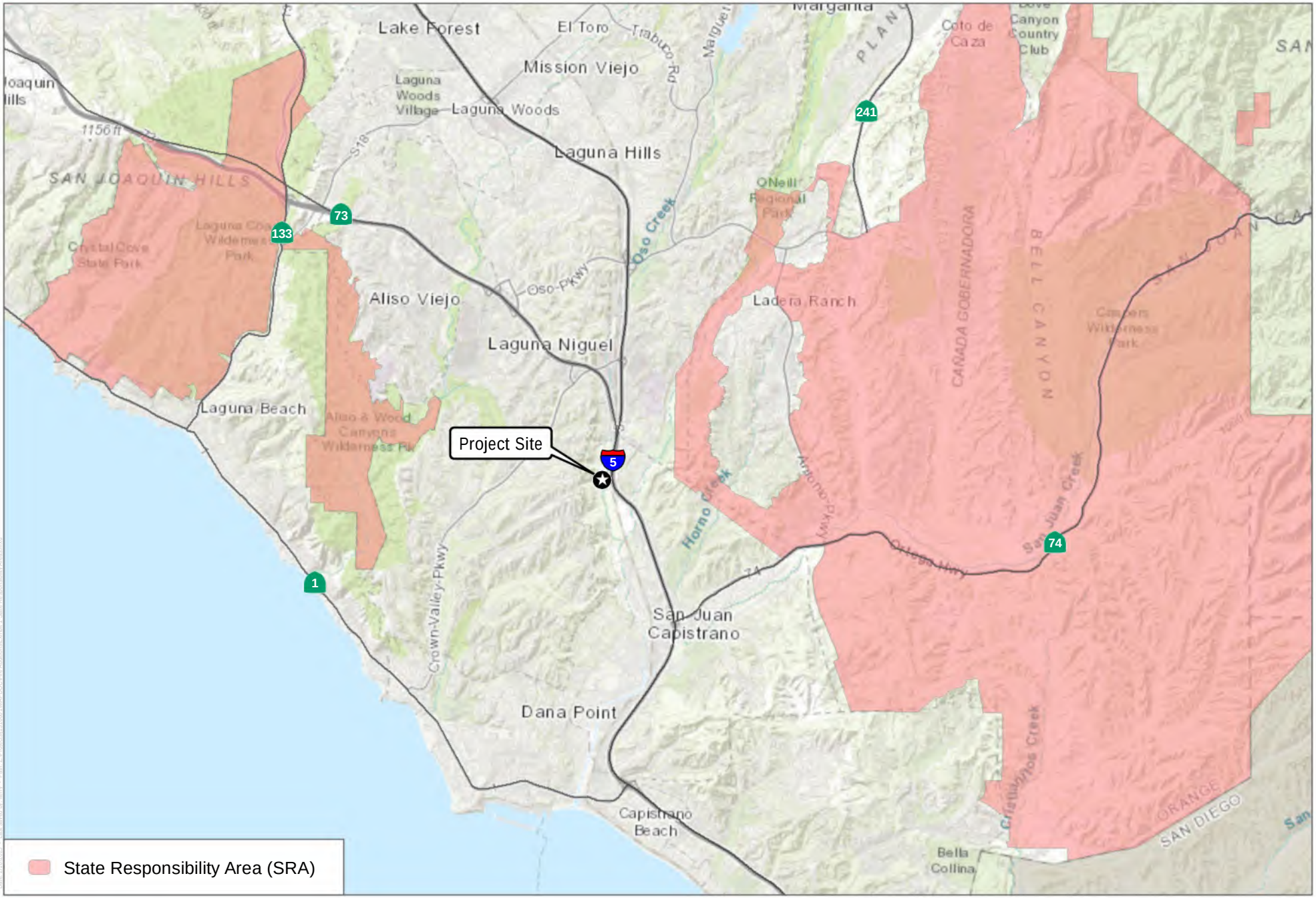

SOURCE: ESRI IMAGERY 2022

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EXHIBIT 1

State Responsibility Areas

Compass BESS Project

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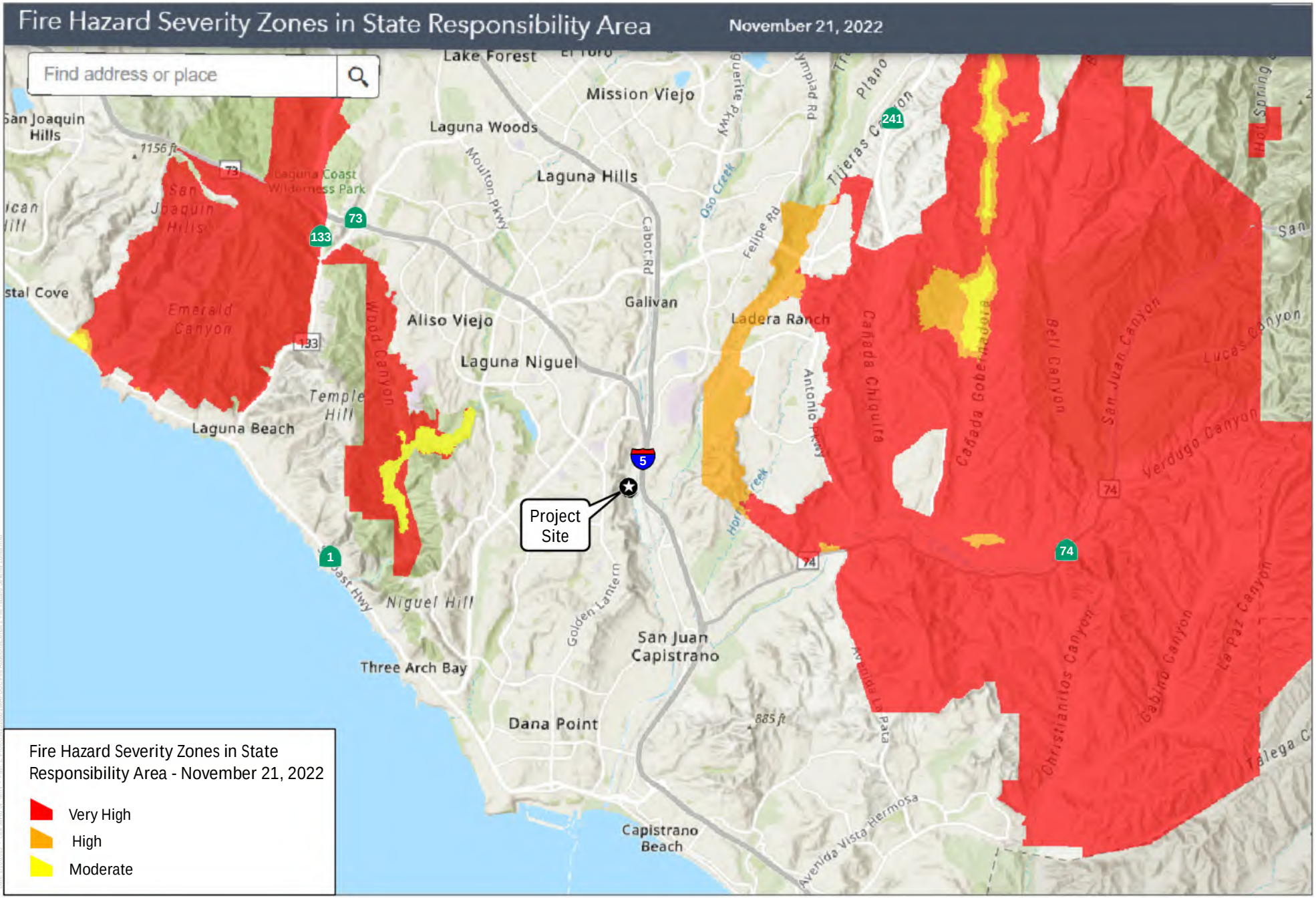

SOURCE: ESRI IMAGERY 2022; CAL FIRE 2022

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EXHIBIT 2

Fire Hazard Severity Zones

Compass BESS Project

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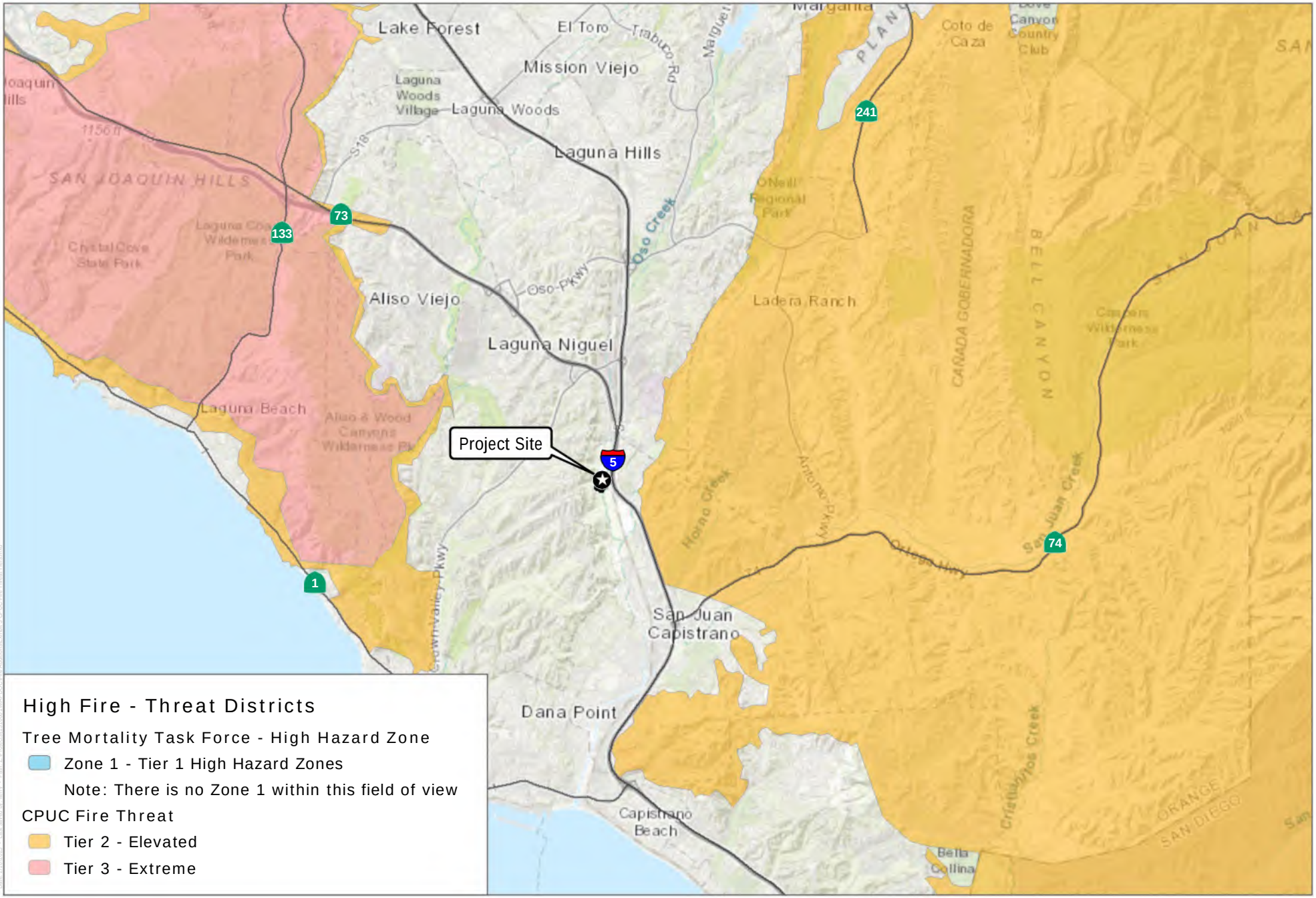

SOURCE: ESRI IMAGERY 2022; CPUC 2022

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EXHIBIT 3

CPUC Fire Threat Tiers

Compass BESS Project

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Table 1. Fire Behavior Modeling Results for Existing Conditions

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
***Scenario 1**: 5% slope, 40 mph N wind (offsite origin approaching proposed project site)*				
Fuel Model GR1 (mowed grass/forbs)	3.1	67	0.5	0.3
***Scenario 2**: 5% slope, 20 mph S wind (offsite origin approaching proposed project site)*				
Fuel Model GR1 (mowed grass/forbs)	2.3	35	0.3	0.2
***Scenario** 3: 30% slope, 40 mph NE wind (onsite origin through adjacent land)*				
Fuel Model GR7 (upland mustard)	61.3	43624	15.0	2.6

Table 2. Fire Behavior Modeling Results for Post-Project Conditions

Fire Scenarios	Flame Length (feet)	Fireline Intensity (BTU/feet/second)	Spread Rate (mph)	Spotting Distance (miles)
***Scenario 1**: 5% slope, 40 mph N wind (offsite origin approaching perimeter precast wall)*				
Fuel Model GR1 (mowed grass/forbs)	3.1	67	0.5	0.3
***Scenario 2**: 5% slope, 20 mph S wind (offsite origin approaching perimeter precast wall)*				
Fuel Model GR1 (mowed grass/forbs)	2.3	35	0.3	0.2
***Scenario** 3: 30% slope, 40 mph NE wind (onsite origin)*				
Fuel Model GR7 (upland mustard)	61.3	43624	15.0	2.6

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SOURCE: AERIAL-ESRI IMAGERY SERVICE 2023

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FIGURE 4

BehavePlus Analysis

Compass BESS Project

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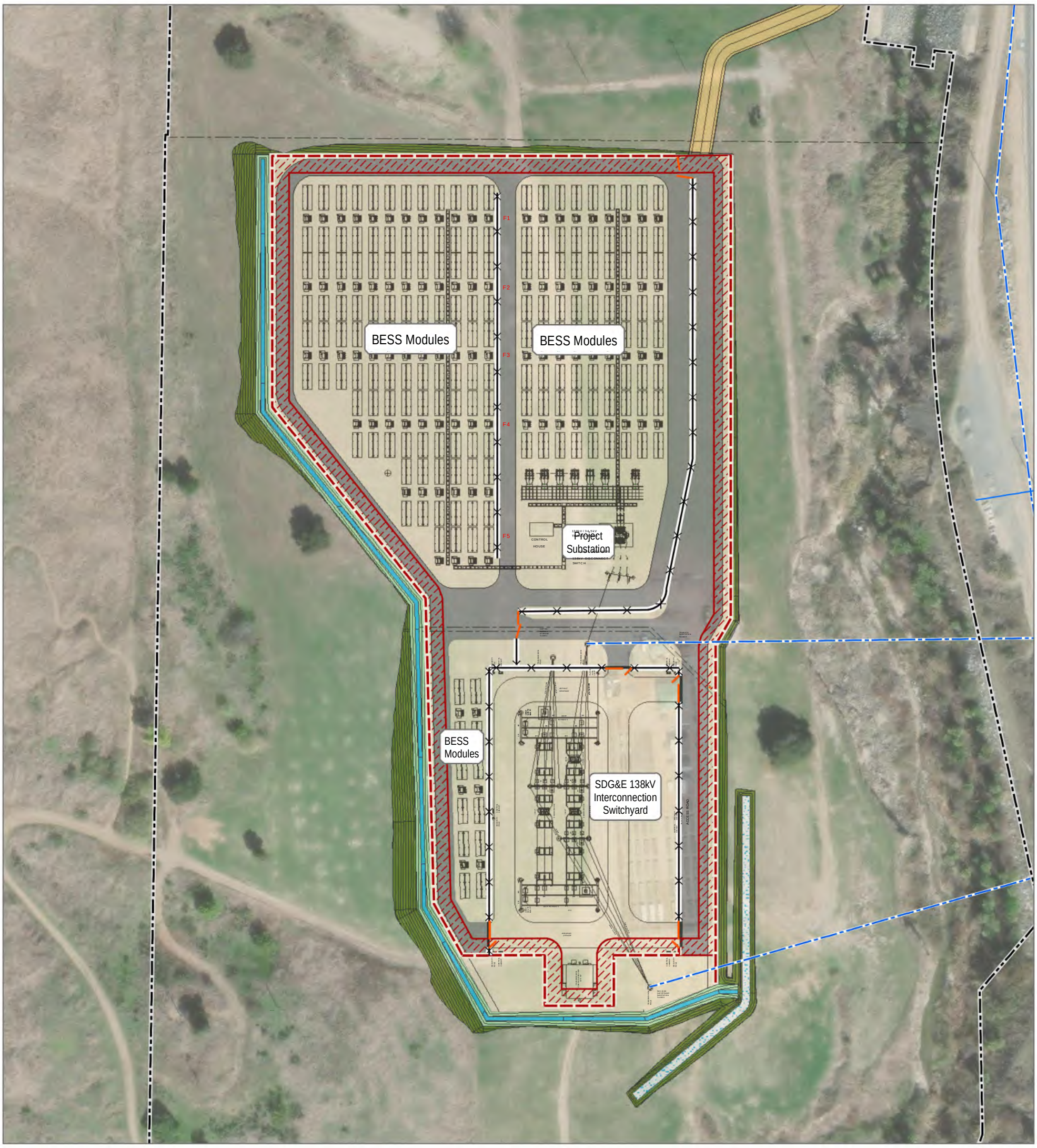

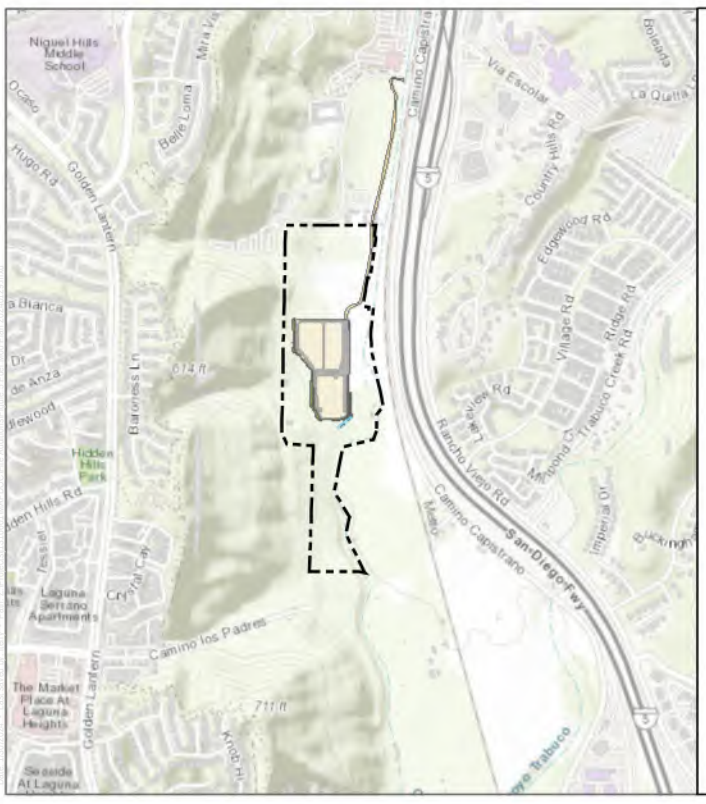

- 10-Ft Precast Fire Wall
- 6-Ft tall Security Fence with 3-strand Barbed Wire
- Gates

ExistingTransmission Alignment

- SDG&E Trabuco to Capistrano transmission line (138kV)
- Fiber
- APN 637-082-71
- 20-Ft Fuel Modification Zone
- Non-combustible Surface/Graded Work
- Internal Access Roads for Emergency Access
- Contour Grading
- Drainage Ditch
- Drainage Side Slopes
- Channel
- Offsite Access Road/Emergency Vehicle Access

FIRE RECOMMENDATIONS:

-Project to be compliant with 2022 CFC 1206, Electrical Energy Storage Systems

-Project to be compliant with OCFA Guideline G-10, Stationary Storage Battery Systems

- Fire suppression systems inside each container as proposed (NFPA 855 compliant)

- 10' tall perimeter precast, decorative concrete walls to OCFA satisfaction

- 20' FMZ - entire area within walls to be void of vegetative fuel - gravel or similar surface

- Landscaped areas to include fire-resistant landscaping consistent with fuel modification zone requirements

- Maintain FMZs twice-yearly or more as needed

- 20' wide access roads per OCFA standards

- Hydrants located per OCFA standards

SOURCE: AERIAL-ESRI IMAGERY SERVICE 2022; SITE PLAN-SARGENT & LUNDY 2024

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FIGURE 5

Fuel Modification Plan

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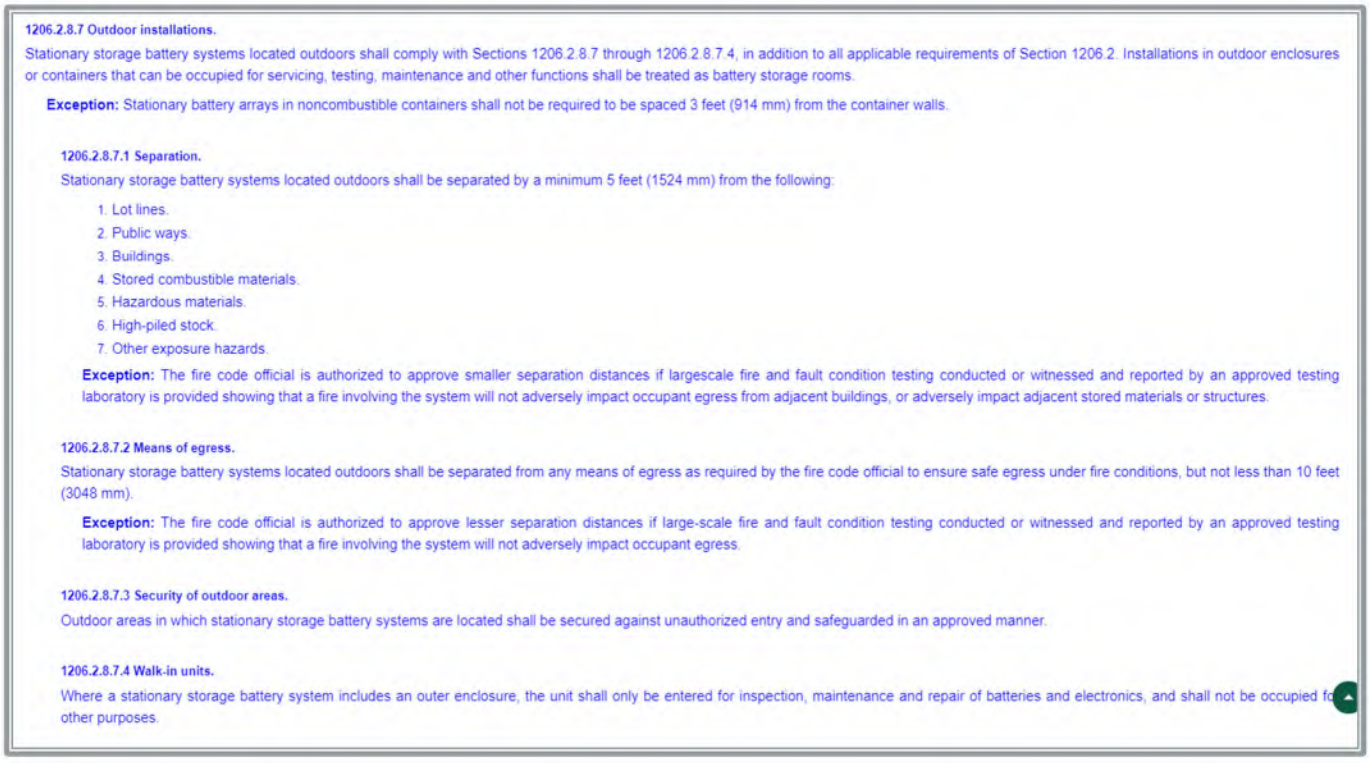
Appendix A

Excerpt from California Fire Code – Battery Storage

Excerpt from California Fire Code regarding stationary storage battery systems.



1206.2.8.7 Outdoor installations.

Stationary storage battery systems located outdoors shall comply with Sections 1206.2.8.7 through 1206.2.8.7.4, in addition to all applicable requirements of Section 1206.2. Installations in outdoor enclosures or containers that can be occupied for servicing, testing, maintenance and other functions shall be treated as battery storage rooms.

Exception: Stationary battery arrays in noncombustible containers shall not be required to be spaced 3 feet (914 mm) from the container walls.

1206.2.8.7.1 Separation.

Stationary storage battery systems located outdoors shall be separated by a minimum 5 feet (1524 mm) from the following:

1. Lot lines.
2. Public ways.
3. Buildings.
4. Stored combustible materials.
5. Hazardous materials.
6. High-piled stock.
7. Other exposure hazards.

Exception: The fire code official is authorized to approve smaller separation distances if largescale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

1206.2.8.7.2 Means of egress.

Stationary storage battery systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but not less than 10 feet (3048 mm).

Exception: The fire code official is authorized to approve lesser separation distances if large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

1206.2.8.7.3 Security of outdoor areas.

Outdoor areas in which stationary storage battery systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

1206.2.8.7.4 Walk-in units.

Where a stationary storage battery system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied fo other purposes.

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Appendix B

Example Pre-Cast Concrete Fire Protection Wall

Appendix B. Examples pre-cast, decorative wall at battery energy storage site. Note height compared to battery storage containers. Note also ground cover and lack of vegetation.

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