

**WILDLAND FIRE PROTECTION PLAN**  
**Valley Center Storage Project**  
**29523 Valley Center Road, Valley Center, CA**  
**Project # PDS 2020-IC-20-003**



**April 2020**

*Prepared for the County of San Diego on behalf of the Owner,  
Valley Center ESS, LLC*

Prepared by: \_\_\_\_\_

A handwritten signature in blue ink, appearing to read "Sid Morel", written over a horizontal line.

**Sid Morel, President**  
***Santa Margarita Consulting, LLC.***  
**308 Industrial Way,**  
**Fallbrook, CA 92028**

## Table of Contents

EXECUTIVE SUMMARY.....	3
1. INTRODUCTION .....	5
<u>1.1 Project Location, Description and Environmental Setting</u> .....	5
1.1.1 Project Location .....	5
1.1.2 Project Description .....	8
1.1.3 Environmental Setting.....	10
2. GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE.....	13
3. ANTICIPATED FIRE BEHAVIOR IN THE VICINITY .....	16
4. ANALYSIS OF PROJECT EFFECTS .....	19
4.1 Adequate Emergency Services.....	19
<u>4.2 Fire Access</u> .....	20
4.2.1 Gates .....	20
4.3 Water Supply.....	21
<u>4.4 Ignition Resistant Construction and Fire Protection Systems</u> .....	21
4.4.1 Technical Report.....	23
4.5 Fire Fuel Assessment .....	24
4.6 Predicting Wildland Fire Behavior .....	24
4.6.1 Wildland Fire Behavior Calculations for the Off-Site Hazardous Vegetative Fuels .....	25
4.7 Cumulative Impact Analysis.....	28
5. MITIGATION MEASURES AND DESIGN CONSIDERATIONS .....	29
6. CONCLUSION.....	30
7. LIST OF PREPARERS, PERSONS AND ORGANIZATIONS CONTACTED .....	31
8. REFERENCES .....	32
9. TECHNICAL APPENDICES .....	
Appendix A.....	33
Appendix B.....	36
Appendix C.....	48
Appendix D.....	49
Appendix E.....	50

## EXECUTIVE SUMMARY

This Fire Protection Plan has been prepared for Valley Center ESS, LLC (Developer). The Developer plans to construct, own and operate the Valley Center Storage Project, a lithium-ion based battery energy storage facility capable of delivering up to 140 megawatts (MW) for approximately 4 hours on an 8.93-acre parcel and associated utility and access easement in Valley Center, San Diego County (the Project). The Project will interconnect to the existing, adjacent San Diego Gas & Electric (SDG&E) 69kV Valley Center Substation via an approximately 0.3-mile underground generation tie line (gen-tie line). The Project will be comprised of sets of four battery enclosures (each enclosure approximately 31.6 feet long by 5.7 feet wide by 8.6 feet high) that will house the integrated Battery Energy Storage System (BESS) including battery cells, modules, racks, a fully integrated fire and safety systems, HVAC systems, and other electrical systems. The batteries will be charged from the CAISO (California Independent System Operator) grid via the Project's interconnection to the SDG&E Valley Center Substation. Energy stored in the Project will then be discharged back into the grid when the energy is needed, providing essential electricity reliability services to the local area. The Project plans to start construction in the fourth quarter of 2020 and begin operations by August 1, 2021.

Lithium-ion battery storage facilities, like the Project, are a key component of California's clean, low-carbon and renewable electrical generation future. Their usage reduces California's dependence on fossil fuels burned to generate electricity because batteries are capable of charging and storing energy during the day when renewable generation is abundant and demand is low and then deploying that energy when demand is high.

The Project is located within the industrial/commercial area of Valley Center where neighboring uses include concrete forming, equipment and self-storage facilities, propane gas distributors, and the adjacent SDG&E electrical distribution substation. Adjacent to the Project site both to the west and north are commercial operations co-located with residential uses; each located on industrially-zoned parcels. To the north of the Project site, across Valley Center Road, is the SDG&E 69kV Valley Center Substation. A rural agriculturally zoned property is located east and south of the Project site, where ornamental eucalyptus shrubs are in production.

The overall wildland fire threat at the Project site is minimal. The Project site is currently vacant and has a mixture of non-native vegetation and weeds. The area within the northern portion of the site contains a large amount of dead and downed vegetation, along with flammable weeds and rocky terrain. While wildland fire threat is minimal, if this vegetation is left as-is, it could represent a potential fire risk. As part of site preparation activities at the onset of Project construction, the Developer will remove dead/downed vegetation in areas within the Project site that lie outside the facility improvements in order to establish a fuel modification zone. Further, the Project will maintain a setback of a minimum of 30 feet between containers and the property boundary. This setback will be cleared and maintained to eliminate potential fuel. Further protection will include utilizing vinyl or similar solid fencing between Project

containers and the property boundary. Any vegetation removal would be done utilizing methodologies that ensure any potential sensitive resources are not impacted. These activities are expected to reduce the fire threat to very low. See photographs, Appendix B.

## **CHAPTER 1. INTRODUCTION**

The purpose of a Fire Protection Plan (FPP) is to assess potential impacts resulting from wildland fire hazards and identify measures necessary to adequately mitigate those impacts. This FPP (or plan) has been prepared for the Valley Center Storage Project (Project) and, as part of the assessment, has considered the Project location, topography, geology, combustible vegetation (fuel types), climatic conditions, and fire history of the Project area. The Project FPP has been prepared to:

- Address water supply, access, structural ignitability and fire resistive building features, fire protection systems and equipment;
- Identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment to protect potential at risk communities and essential infrastructures; and
- Recommend measures that the Project will take to reduce the probability of ignition.

### **1.1 Project Location, Description and Environmental Setting**

#### **1.1.1 Project Location**

The Project site is located at 29523 Valley Center Road, Valley Center, California on a parcel of private land (APN 189-013-20-00) within unincorporated Valley Center in San Diego County (Figure 1). San Diego County (County) identifies land use and zoning of the Project site as Medium Impact Industrial (I-2) and General Impact Industrial (M54) use regulation. Permitted uses in the Medium Impact Industrial zone are manufacturing, processing, and assembly; warehousing and distribution; large equipment supply and sales; and other industrial or commercial activities. The M54 use regulation allows for unenclosed commercial and industrial operations having potential nuisance characteristics such as construction, sales and services. The County of San Diego has identified the Project as a Minor Impact Utility, defined as public utilities which have a local impact on surrounding properties and are necessary to provide essential services. All Minor Impact Utilities, including the Project, are permitted by right within the M54 use regulation (County of San Diego Zoning Ordinance).

Additionally, the Project Area is located in an area under County Special Area Regulations, Designator B: Community Design Review Area, where visual impacts criteria must be met through a limited Site Plan approval process. These regulations are intended to ensure that added consideration is provided to visual impacts in areas of special interest. Surrounding land uses include Limited Impact Industrial to the north, Semi-Rural Residential (SR-4 and SR-2) to the east and south, and Medium Impact Industrial to the west (Figure 2). The Project is consistent with the visual nature of the surrounding existing industrial and commercial uses. The picture on the cover of this report provides a representative visual rendering of the Project and the surrounding uses.



Figure 1

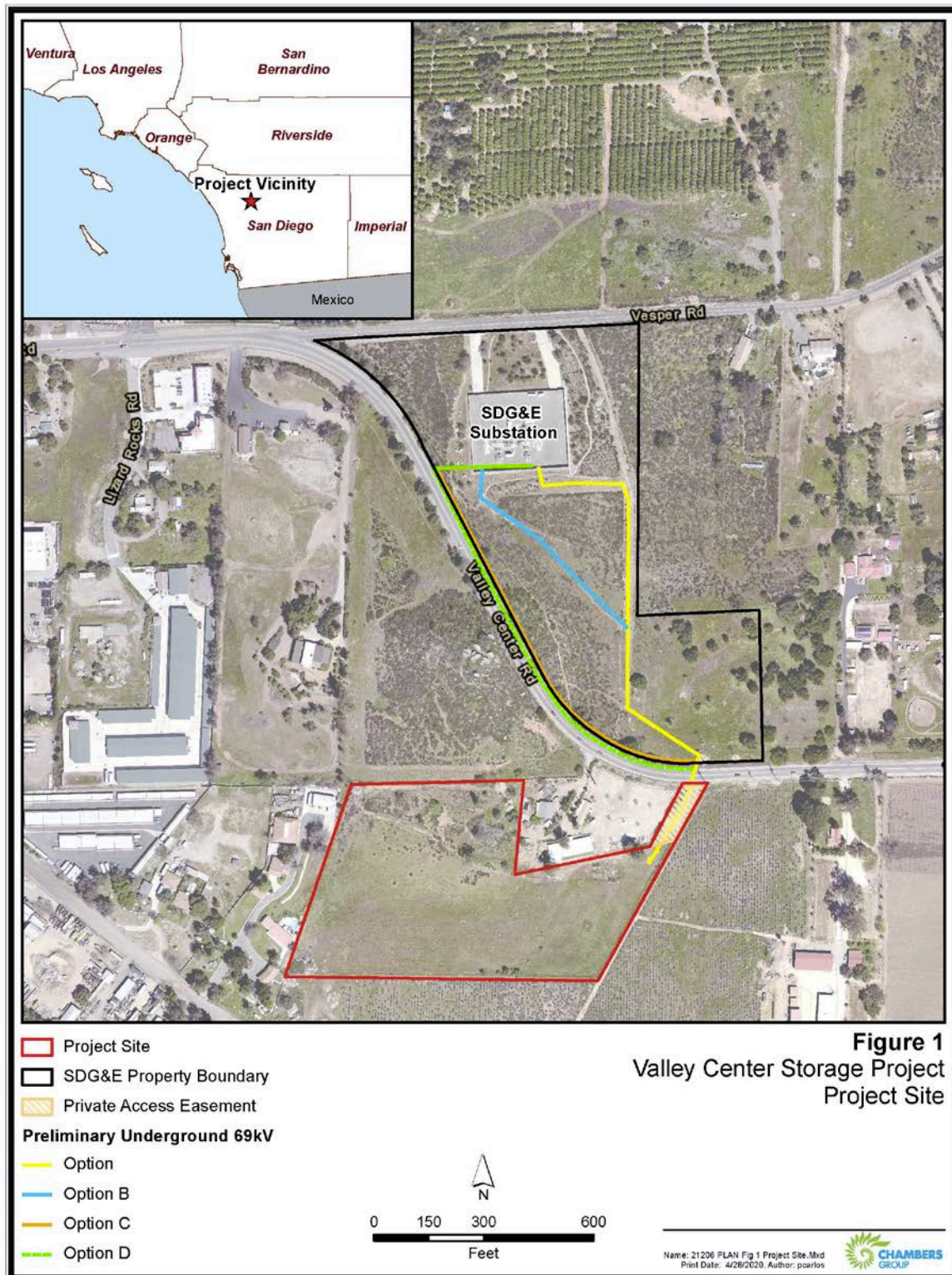
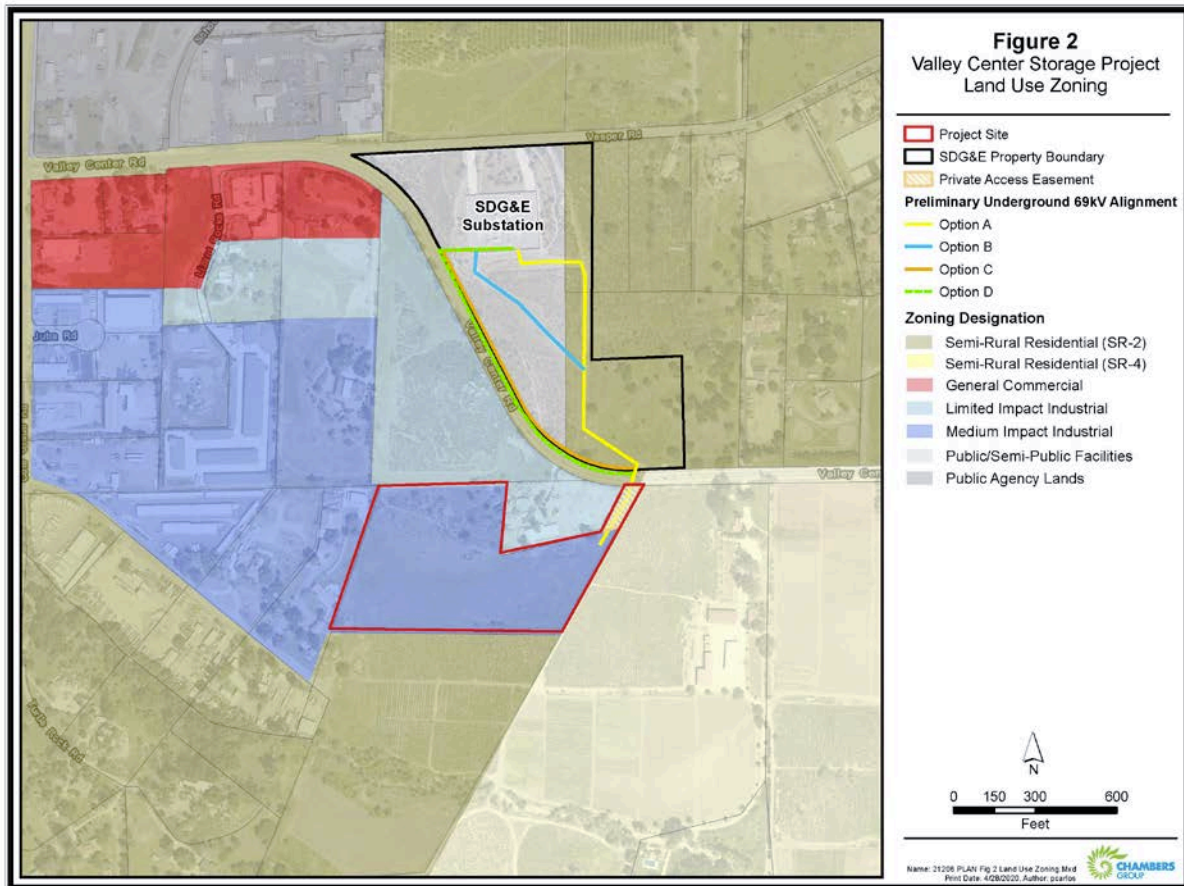


Figure 2



The Project site is defined as the 8.93-acre parcel and the Project-controlled access easement. The Project Area is described as the Project site and the off-site underground gen-tie line alignment.

### **1.1.2 Project Description**

The Project will be comprised of lithium ion battery modules housed in cabinets within up to 58 sets of 4 non-walk-in enclosures on dedicated foundations that will be capable of charging and delivering up to 140MW for approximately 4 hours. Each enclosure will contain integrated battery, heat/fire and safety management systems including electrical and mechanical controls, ventilation systems, HVAC, fire alarm detection and heat management systems. From the BESS containers, low voltage cables will connect to low profile, pad- inverter/transformers located adjacent to the BESS units, and to a control center enclosure called a Power Distribution Center (PDC).

The Project's preventative measures and state-of-the-art fire and safety systems, as more fully described in Chapter 2 of this FPP, make a thermal runaway event very rare. Furthermore, in the unlikely event of thermal runaway, the Project's preventative measures and systems are designed to limit the event to a single battery module as well as reduce the duration and intensity of an event if it occurs. The Project is subject to the requirements of Chapter 12 of the 2019 California Fire Code and will utilize pre-engineered battery storage systems and equipment certified under UL 9540, the established Standard for Energy Storage Systems and Equipment. The UL 9540 rating establishes the design limit of a thermal runaway events to a single battery module.

Major Project equipment and facilities include:

- Up to 58 sets of 4 BESS enclosures including battery modules and integrated battery, fire and safety management systems.
- Up to 58 pad-mounted inverter/transformers located adjacent to each set of BESS enclosures to convert direct current into alternative current and step the units' voltage up to 34.5 kV.
- 2 PDC enclosures which are modular electrical equipment enclosures housing energy management systems, communications/SCADA equipment, and other electrical equipment.
- A BSU (Battery Step-Up Transformer), circuits will enter the BSU from the PDC at 34.5 kV where voltage will be stepped up to 69kV.
- An approximately 0.3-mile 69kV gen-tie line will be constructed from the Project BSU north across Valley Center Road to SDG&E 69kV Valley Center Substation across one of four alignment options (described further below).
- Security lighting and fencing
- Stormwater drainage and retention basins
- Signage

The exact size and quantity of the battery storage containers and inverter transformers may vary depending on the battery and BESS manufacturer(s) selected for the Project.



Access to the Project site is provided from Valley Center Road via a permanent Project-controlled easement. The site access road will comply with County regulations and be stabilized using gravel in order to provide facility access to operational, fire department, and emergency vehicles. Project site equipment and facilities (with the exception of stormwater drainage and retention basins) will be surrounded by a solid, 8-foot tall vinyl fence or a similar solid fence. The fence will be built flush with the ground and have the appearance of a paneled wood fence. Existing fences surrounding the property boundary will remain. The Project design will adhere to County Guidelines, including the Valley Center Design Guidelines. Lighting at the Project site will be installed per County requirements.

The Project will be un-manned during operations, with no buildings or parking areas. The Project would not require restroom facilities. Any operational water that may be required for routine maintenance would be trucked in from offsite or sourced by a new Valley Center Municipal Water District (VCMWD) service. No groundwater would be used for any purposes during construction or operational phases of the Project. The Project will interconnect to the existing, adjacent SDG&E 69kV Valley Center Substation via a Project-constructed underground gen-tie line that, upon leaving the Project site will cross Valley Center Road heading north onto SDG&E property for approximately 0.3 miles. Four alignment options are being considered and evaluated for the gen-tie line (Figure 1). All four options leave the Project site access easement, cross under Valley Center Road and then:

- Option A: enters SDG&E's property and heads north, adjacent to existing SDG&E underground circuits within SDG&E's property and enters the substation at the point of interconnect.
- Option B: enters SDG&E's property following Option A, but travels across the property in a northwesterly direction until reaching the substation.
- Option C: follows the southern and western property boundaries within SDG&E's property until turning easterly to access the substation from the west.
- Option D: follows the west-bound Valley Center Road right-of-way before entering SDG&E's property, following Option C in the easterly direction to access the substation.

All four options are approximately the same length.

The Project will be operated, monitored and dispatched remotely on a day-to-day basis. Crews of two to four person's will periodically visit the site (approximately twice per month) for routine inspection and maintenance of the facilities and site. The Developer will own and maintain the gen-tie line up to the point where the gen-tie line enters SDG&E property, where ownership and maintenance responsibilities will be transferred to SDG&E.

The facility is anticipated to have a Project life of approximately 30 years. At the end of the Project life, most of the Project's enclosures, batteries, and electrical equipment

(breakers, transformers, inverters) would be removed and recycled. Equipment foundations and pads would be demolished and removed.

### **1.1.3 Project Construction**

Project construction includes site preparation and grading, installation of drainage and retention basins, foundations/supports, setting battery enclosures, wiring and electrical system installation, and assembly of the accessory components including inverter transformers and generation step-up transformers. The Project would require the grading of approximately 3,000 cubic yards of soils, balanced on site (no net import or export). The approximately 0.3-mile gen-tie line will be installed underground by the Project to the SDG&E 69kV Valley Center substation.

### **Construction Schedule, Sequence and Phasing**

In accordance with the County Noise Ordinance, Project construction will occur between the hours of 7:00AM and 7:00PM Monday through Saturday. Construction of the Project is anticipated to occur over approximately 6 months, beginning as early as fourth quarter 2020. Project construction would likely occur in two phases:

- Phase 1 – Installation of battery storage enclosures and associated civil, electrical and structural features placed outside of the floodplain. During Phase 1, ancillary features, such as graveled access roads and underground electrical components, that are not considered “encroachment” would be installed within the floodplain.
- Phase 2 – Installation of remaining battery storage enclosures and associated civil, electrical and structural features placed within the floodplain; includes features, such as pad-mounted switchgear, step-up transformer(s), and a control center enclosure, that could be considered “encroachment” within the floodplain.

The two construction phases would likely be executed consecutively; Phase 1 followed by Phase 2. However, for the purposes of preparing a worst-case CEQA analysis, technical analyses were completed assuming the two construction phases would occur simultaneously over a period of approximately 6-12 months.

The sequence of construction activities for the BESS would generally occur as follows (with activities limited within the floodplain as described in Phase 1 and Phase 2 above):

1. Equipment staging and mobilization
2. Site preparation and grading
3. Preparation of equipment foundations
4. Site compaction and gravel as necessary
5. Excavating footings and pads
6. Pour-in-place concrete footings, pad foundations, and/or piers
7. Install below-ground conduit banks

8. Install PCS, power distribution systems, and pad-mounted transformers
9. Install below-ground and above-ground conduit
10. Install safety features, permanent fencing and security lighting
11. Commissioning

The approximately 9 acre-feet of water required during the duration of construction is expected to be provided by VCMWD through a temporary use agreement.

### **Construction Personnel and Equipment**

Construction personnel are expected to consist of approximately 10 to 15 workers on average, depending on the construction activities. Project laydown and construction staff parking is expected to be located on-site to the extent practicable. The Project may need to utilize an offsite temporary use area, up to approximately 2 acres in size, for equipment storage during construction. Should it be needed, the temporary use area would be located within 2 miles of the Project site, on a site that has been previously disturbed, and where temporary equipment storage is an allowable use and compatible with the existing uses on the property. The technical analyses prepared for the Project have been conducted assuming use of a temporary offsite area following these parameters. If it is determined that use of a temporary offsite area is needed during Project construction, the selected location will be submitted to the County and shown to be consistent with the technical analyses performed for the Project.

Typical equipment expected to be used during Project construction and commissioning:

- Excavator (2)
- Backhoe (2)
- Dozer (1)
- Roller/Compactor (1)
- Dump truck (2)
- Concrete mixer (3)
- Flatbed-mounted utility crane (1)
- Portable generator and welding equipment (1)
- Forklift (1)
- Pickup trucks (4)
- Utility line trucks (2)

#### **1.1.4 Environmental Setting**

Dave Bacon, of Wildfire Mitigation Strategies and Inspection, conducted a site visit on March 25, 2020 and documented fuel loads consisting of agricultural farming and residential vegetation, with a small amount of native vegetation to the north of the Project site development footprint (see pictures, Appendix B).

The weather at the Project site is consistent with Inland San Diego County with highs typically reaching mid 90's in the summer and mild winters with occasional frost. The United States Geological Survey *Valley Center, California* Quadrangle 7.5-minute series topographic map was reviewed and the onsite elevations are at or around

approximately 1,370 feet above mean sea level (Partner , 2019). Contour lines of the area surrounding the Project site indicate the area is generally sloping downward toward the south (Partner , 2019).

The Paradise fire of 2003 threatened the Valley Center area and came within approximately two miles of the Project site (see Figure 3). Since 2003, numerous homes, development and agricultural activities have been built, rebuilt, or developed north and east of the Project site (see Figures 3 and 4). In these instances, the new development would have met the restrictive wildland fire codes in existence at that time. Therefore, the fuel available for a wildland fire has been reduced compared to 2003.

## **Chapter 2. GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE.**

A Fire Protection Plan evaluates the potential adverse environmental effects that a project may have from wildland fire and proposes appropriate mitigation for potential adverse impacts to ensure the project does not expose people or structures to a significant risk of loss, injury or death in regard to wildland fire. The following guidelines for the determination of significance are used (Department of Planning and Land Use, Department of Public Works , 2010):

### ***1. Does the project demonstrate compliance with all applicable WUI fire codes?***

Answer: Yes, this FPP in combination with District permit and inspection processes will ensure the applicable building codes are followed to allow the structures to resist ignition from a wildland fire and develop adequate fuel modification around the structures to meet County and State fire code requirements. The Project would comply with applicable fire and building codes and would include other fire protection measures such as a removal of dead and downed vegetation onsite and adequate fire/emergency access.

In addition to this FPP, a Fire Technical Report (Technical Report) has been requested by the Valley Center Fire Protection District (VCFPD; District) (see Appendix C), The information requested in the Technical Report, along with operational information such as contact information and process for updating the District when batteries are exchanged or replaced, will be developed and submitted to the District once the specific technology has been selected prior to operation of the Project.

Further, the Project's UL-certified preventative measures and state-of-the-art fire and safety systems make a thermal runaway event very rare. In the unlikely event of thermal runaway, the Project's preventative measures and systems are designed to limit the event to a single battery module as well as reduce the duration and intensity of an event if it occurs.

The Project is subject to the requirements of Chapter 12 of the 2019 California Fire Code and will utilize pre-engineered battery storage systems and equipment certified under UL 9540, the established Standard for Energy Storage Systems and Equipment. The UL 9540 rating establishes the design limit of a thermal runaway events to a single battery module. The 2019 California Fire Code was published July 1, 2019, with an effective date of January 1, 2020. The 2019 California Fire Code, Title 24, Part 9, Chapter 12, Energy Systems, requires pre-packaged and pre-engineered stationary storage battery systems to be listed in accordance with UL 9540, Standard for Energy Storage Systems and Equipment. This standard was developed for energy storage systems and are intended for installation and use in accordance with the National Electrical Code, NFPA 70, the Canadian Electrical Code, Part I Safety Standard for Electrical Installations, CSA C22.1, the National Electrical Safety Code, IEEE C2, the International Fire Code, ICC IFC, the International Residential Code, ICC IRC, the National Fire Code of Canada, NRC



NFC, the Fire Code, NFPA 1, and the Standard for the Installation of Stationary Energy Storage Systems, NFPA 855.

UL 9540 serves as the system certification and does so by incorporating and making references to many other codes. It references over 60 other rules, including UL 1973 (batteries), UL 1741 (inverters), ASME B31 (power piping), ASME B & PV (boiler & pressure vessel), ASHRAE 62.1 (ventilation), NFPA 70 (electrical). Aspects of the code relevant to this Project are summarized below.

UL 9540 contains safety standards for the system's construction (e.g., frame and enclosure, including mounting, supporting materials, barriers and more); the insulation, wiring, switches, transformers, spacing and grounding; safety standards for performance of over twenty different elements, such as tests for temperature, volatility, impact, overload of switches, and an impact drop test; and standards for manufacturing, ratings, markings, and instruction manuals. In addition to the many individual standards referenced, UL 9540 compliance requires a Failure Mode and Effects Analysis (FMEA) be performed and requires a test to ensure safe compatibility of the system's parts. Hence, the standard embodies both a "forest and trees" approach, ensuring that the components are certified, that the system as a whole is certified as safe, and that an FMEA has identified the set of things that might still go wrong, and taken action to mitigate those risks.

Chapter 12 of the 2019 California Fire Code also requires the use of an Energy Management System, for monitoring and balancing cell voltages, currents and temperatures. The system must transmit an alarm signal if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected. The fire code also requires the use of an appropriate fire-extinguishing and smoke detection system, which will be incorporated into each of the Project's BESS enclosures.

UL 9540 incorporates the UL 1973 standard, in which a battery manufacturer must prove that a failed cell inside will not cause a fire outside the system. The Project will meet the UL 9540 and industry standards for adequate separations, cascading protections, and suppression systems to limit failure to a single cell or at least a single

**2. *A comprehensive Fire Protection Plan has been prepared, and is the project consistent with its recommendations? (This portion requires fire modeling)***

Answer: Yes, the location of Project provides a very low risk of being threatened by wildfire. The site will not have buildings and will instead be comprised of metal enclosures and other electrical equipment surrounded by driveways and fencing and, consistent with recommendations made by the District, no landscaping is proposed.

**3. Does the project meet the emergency response objectives identified in the Public Facilities Element of the County General Plan or offer feasible alternatives that achieve comparable emergency response objectives?”**

Answer: Yes, the District's Fire Station 1 is approximately one mile from the Project site with a less than 2-minute travel time, consistent with General Plan Table S-1. The Developer will work closely with the District to ensure that an operations plan is implemented that will allow the District to achieve emergency response objectives. Consistent with the District's requests in Appendix C, the Developer will submit an operations plan that includes supply details for the manufacturer and technical specifications, as well as a Technical Report utilizing the technology selected for the Project. Additionally, the Developer will provide assistance to the District to ensure applicable Project training for fire crews, site access and requirements for the District. Lastly, the Project site will be annexed into the Community Facilities District (CFD) 2008-1, that assesses a special tax for the CFD that supports the District.

Further, implementation of this FPP will ensure that the Project is consistent with the General Plan goals and policies related to Fire Prevention including:

- **Minimized Fire Hazards:** The Project has minimized injury, loss of life, and damage to property resulting from structural or wildland fire hazards.
- **Managed Fuel Loads:** The Project will assist with the management of fuel loads through vegetation clearing and removal of dead and downed vegetation onsite to establish an appropriate a fuel modification zone. Consistent with recommendations from the District, the Project does not propose to install perimeter landscaping.
- **Adequate Fire and Medical Services:** The Project includes continued and close coordination with the District to ensure adequate levels of fire and emergency medical services are available to include any required for construction and operation of the Project.

### **Chapter 3. ANTICIPATED FIRE BEHAVIOR IN THE VICINITY**

The Paradise Fire of October 2003 burned 56,545 acres (see Figure 3), resulted in the deaths of two people, and destroyed 221 homes (Jones, 2013). Since the Paradise Fire, Valley Center has seen numerous homes built and a surge in commercial development. The result of this has been the removal of large expanses of flammable vegetation and dead groves and orchards.

Adjacent commercial operations are co-located with residences both west and north of the Project site, all located on industrially-zoned parcels. The properties immediately surrounding the Project site consist of residential/commercial use and vacant land to the north; agricultural land and commercial properties to the south; agricultural properties to the east; and residential, industrial, and commercial properties to the west. The Project site is relatively flat and is located within the industrial and commercial area of Valley Center, see Figure 4. The Fire Behavior model of the vacant land/native vegetation to the north, under worst case Santa Ana wind conditions, shows a flame length of 43.8 feet, see Fire Behavior Appendix A. The Developer will remove dead/downed vegetation within the Project parcel as part of establishing a fuel modification zone. Any vegetation removal would be done utilizing methodologies that ensure any potential sensitive resources are not impacted. Additionally, a minimum of a 30-foot setback between the containers and the property boundary will be cleared and maintained to be devoid of vegetation.

### Figure 3: Fire History

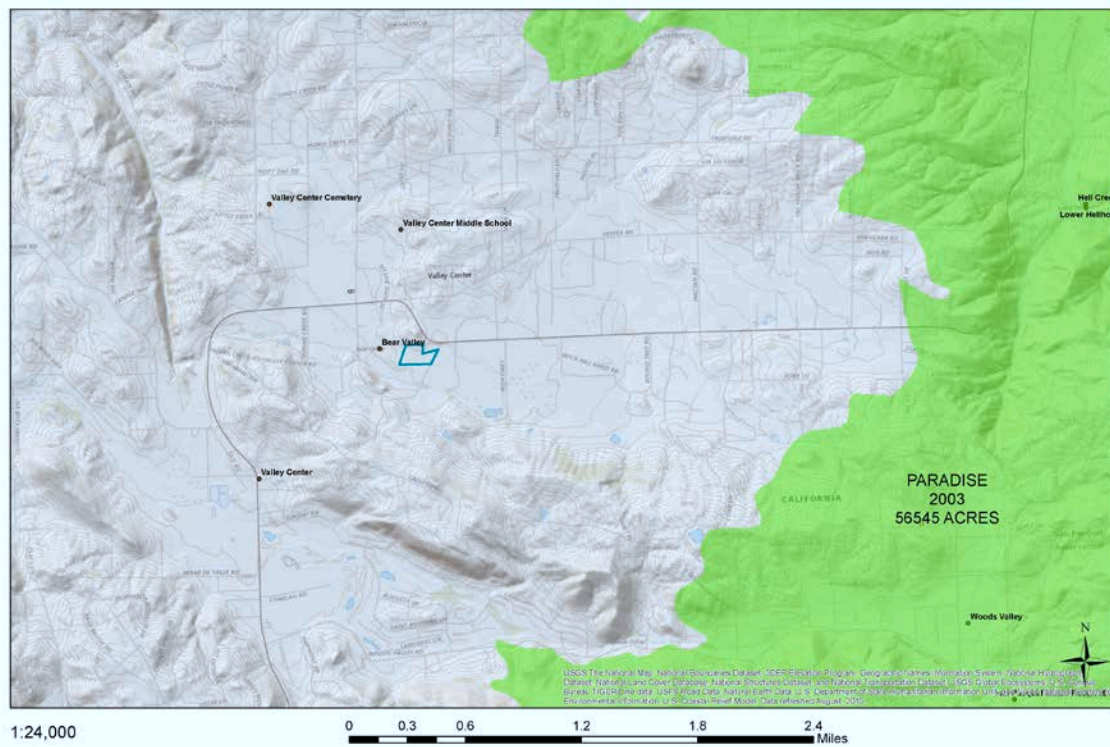
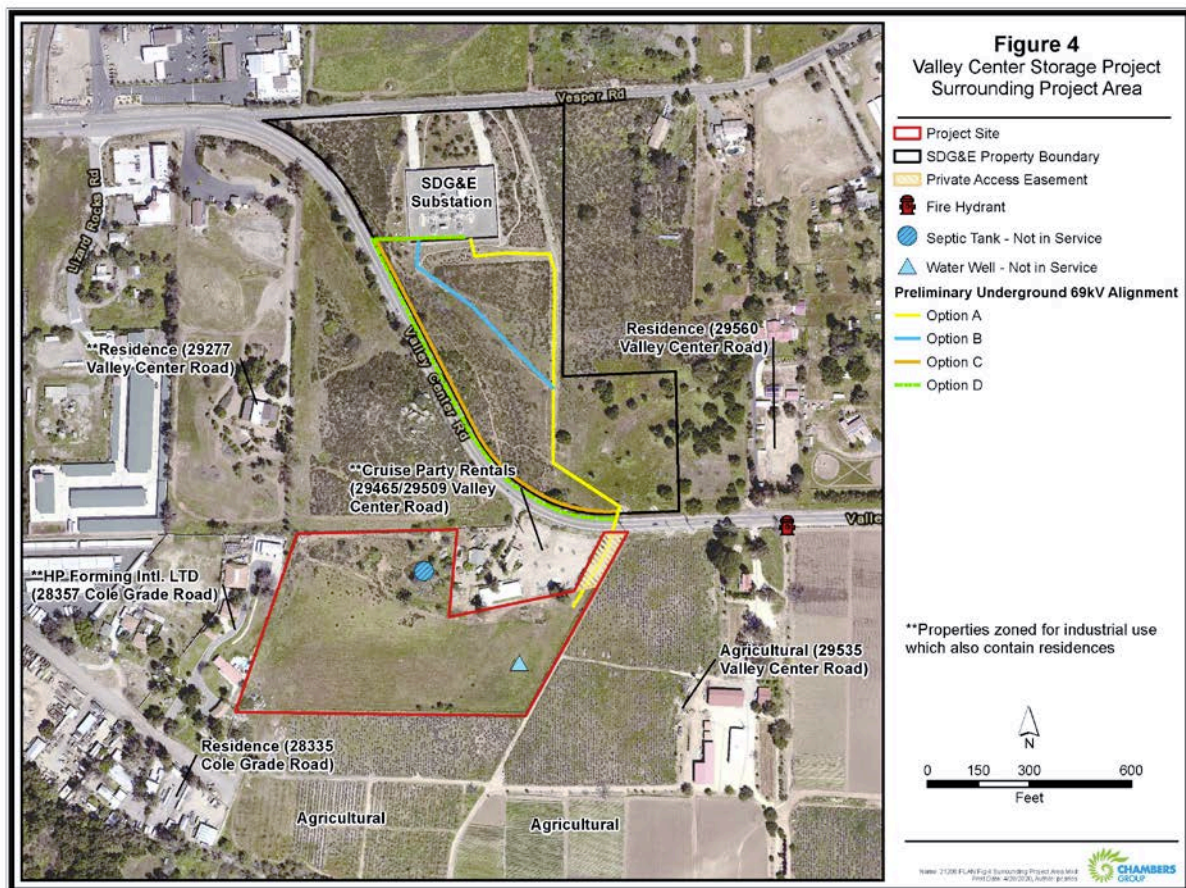


Figure 4





## **Chapter 4. ANALYSIS OF PROJECT EFFECTS**

### **4.1 Adequate Emergency Services**

The District is the fire authority having jurisdiction in the Project area. According to their website, the District has been serving the community since 1981. The District response area covers 84.5 square miles of rural and suburban wildland interface. The District provides service to over 23,000 residents and responds to over 2,000 incidents annually. The District operates out of two strategically located Fire Stations with a third Fire Station in the community based strategic plan to improve service and reduce response times in a climate of increasing demand. The District provides and receives automatic and mutual aid through contractual partnerships with all of the North County Fire Agencies as well as Cal Fire and the Reservation Fire Agencies that are in and around Valley Center (Valley Center Fire Protection District , 2020).

District has adopted an ordinance and a resolution to specifically address their ability to provide adequate suppression services. Ordinance number 54 sets the maximum service availability charge for fire suppression service within the District response area (see Appendix C). Resolution 2019-07 is a special tax levy for the Community Facilities District (CFD), 2000-01, that assesses a special tax for the CFD that supports the District (see Appendix D). This ordinance and resolution are minimal additional fees for service that the Project accepts as a condition of being able to build in Valley Center and continue to have the District provide fire protection services.

The closest District station to the Project site is Fire Station 1 located at 28234 Lilac Road. The Project site is 0.7 miles away from Station 1 and 2.7 miles away from Station 2 (located at 28205 N. Lake Wohlford Drive). Using Google Maps the travel time from Fire Station 1 to the Project site is less than 2 minutes. Chapter 7, Safety Element, Table S-1 of the County of San Diego, Planning and Developmental Services, General Plan states: Commercial and Industrial Designations in the Village Regional Category require a less than 5-minute travel time (County of San Diego, 2011).

The District recently had a Standards of Cover Study, performed by Citygate Associates, LLC. The report states: "First alarm response Multiple-Unit Effective Response Force for Serious Emergencies: To confine fires near the room of origin, to stop wildland fires to under three acres when noticed promptly, and to treat up to three medical patients at once, a multiple-unit response of a minimum of three engines, one paramedic squad or ambulance, and one Battalion Chief totaling 12 personnel should arrive within 14:30 minutes from the time of 9-1-1 call receipt in the North Comm. Fire Communications Center, 90 percent of the time. This equates to 1:30 minutes dispatch time, 2:00 minutes company turnout time, and 11:00 minutes travel time spacing for multiple units in the most populated areas" (Citygate Associates, LLC , 2017). Considering the estimated travel time from the District's Fire Station 1 to the Project site is less than 2 minutes, the Project location would facilitate a much faster travel time for the District engines than the best-case scenario presented in the Citygate study.

## 4.2 Fire Access

Access to the Project site is provided from Valley Center Road via a permanent Project-controlled access easement. The site access easement will comply with County Regulations in order to provide facility access to operational, fire department, and emergency vehicles. The Project will be remotely operated during operations, with no occupied buildings or parking areas. Operations and maintenance crews will visit the site periodically to maintain and monitor the Project and Project site. All fire apparatus access roads shall have an unobstructed width of not less than 24 feet and shall meet the current 75,000 psi standard, by installing compacted class 2 road base, and will meet the 13 feet 6-inch vertical clearance (See Figure 5, Site picture).

The angle of departure from Valley Center Road will meet the following code: **Sec. 503.2.7 Grade.** The angle of departure and angle of approach of a fire access roadway shall not exceed 7 degrees (12 percent) or as approved by the fire code official (San Diego County Fire Marshals, 2017).

### 4.2.1 Gates

Based on coordination with the District and mitigation considerations for other resource areas, the Project will utilize an 8-ft vinyl fence to provide security, screening, and fire protection. Vinyl fencing will be located along surrounding all Project site equipment and facilities (with the exception of stormwater drainage and retention basins) and a gate will be installed that meets current 2017 Consolidated Fire Code of San Diego County, Section 503.6 Security Gates: “an automatic gate across a fire access roadway or driveway shall be equipped with an approved emergency key-operated switch overriding all command functions and opening the gate” (San Diego County Fire Marshals, 2017).

The Developer will affix a NFPA 704 sign to the fence and/or gate identifying the hazard classifications for the site. Along with the NFPA 704 placard, a sign shall be affixed that assists the first arriving unit in proper safe initial operations. The signs contents shall be decided by recommendations from the Technical Report and agreed upon by the District.

[illegible]

There is a residential type fire hydrant approximately 400 feet east of the site access along Valley Center Road (see pictures in Appendix B). The current hydrant spacing along Valley Center Road is every 400 feet. Because water should not be the first extinguishing agent used, this FPP does not recommend the placement of a new hydrant at the driveway.

The Project will be unmanned with no occupied buildings or structures and therefore is consistent with the County Building Code. “All new structures shall comply with the ignition resistive construction requirements: Wildland-Urban Interface areas of sections 701A-712A of the County Building Code” (San Diego County Fire Marshals, 2017).

21

The Project preventative measures outlined in Chapter 2 and state-of-the-art fire and safety systems make a thermal runaway event very rare. Furthermore, in the unlikely event of thermal runaway, the Project's preventative measures and systems are designed to limit the event to a single battery module as well as reduce the duration and intensity of an event if it occurs. The Project is subject to the requirements of Chapter 12 of the 2019 California Fire Code and will utilize pre-engineered battery storage systems and equipment certified under UL 9540, the established Standard for Energy Storage Systems and Equipment. The UL 9540 rating establishes the design limit of a thermal runaway events to a single battery module.

The 2019 California Fire Code was published July 1, 2019, with an effective date of January 1, 2020. The 2019 California Fire Code, Title 24, Part 9, Chapter 12, Energy Systems, requires prepackaged and pre-engineered stationary storage battery systems to be listed in accordance with UL 9540, Standard for Energy Storage Systems and Equipment. This standard was developed for energy storage systems and are intended for installation and use in accordance with the National Electrical Code, NFPA 70, the Canadian Electrical Code, Part I Safety Standard for Electrical Installations, CSA C22.1, the National Electrical Safety Code, IEEE C2, the International Fire Code, ICC IFC, the International Residential Code, ICC IRC, the National Fire Code of Canada, NRC NFC, the Fire Code, NFPA 1, and the Standard for the Installation of Stationary Energy Storage Systems, NFPA 855.

The Project is subject to the requirements of Chapter 12 of the 2019 California Fire Code and will utilize pre-engineered battery storage systems listed under UL 9540. UL 9540 serves as the system certification and does so by incorporating and making references to many other codes. It references over 60 other rules, including UL 1973 (batteries), UL 1741 (inverters), ASME B31 (power piping), ASME B & PV (boiler & pressure vessel), ASHRAE 62.1 (ventilation), NFPA 70 (electrical). Aspects of the code relevant to this Project are summarized below.

UL 9540 contains safety standards for the system's construction (e.g., frame and enclosure, including mounting, supporting materials, barriers and more); the insulation, wiring, switches, transformers, spacing and grounding; safety standards for performance of over twenty different elements, such as tests for temperature, volatility, impact, overload of switches, and an impact drop test; and standards for manufacturing, ratings, markings, and instruction manuals. In addition to the many individual standards referenced, UL 9540 compliance requires a Failure Mode and Effects Analysis (FMEA) be performed and requires a test to ensure safe compatibility of the system's parts. Hence, the standard embodies both a "forest and trees" approach, ensuring that the components are certified, that the system as a whole is certified as safe, and that an FMEA has identified the set of things that could pose a risk, and taken action to mitigate those risks.

Chapter 12 of the 2019 California Fire Code also requires the use of an Energy Management System, for monitoring and balancing cell voltages, currents and temperatures. The system must transmit an alarm signal if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected. The fire code also requires the use of an appropriate fire-extinguishing

and smoke detection system, which will be incorporated into each of the Project's BESS enclosures.

UL 9540 incorporates the UL 1973 standard, in which a battery manufacturer must prove that a failed cell inside will not cause a fire outside the system. The Project will meet the UL 9540 and industry standards for adequate separations, cascading protections, and suppression systems to limit failure to a single cell or at least a single cell.

#### **4.4.1 Technical Report**

The Technical Report shall include the specifics regarding Fire Protection Systems for the Project. See VCFPD's Technical Report Requirement, Appendix E.

The Technical Report shall supply details on manufacturer and specifications for all equipment.

VCFPD requires the Technical Report, specifically from the manufacturer, to provide answers to these questions:

- Failure Modes and Effects Analysis report as specified in CFC 2019 Chapter 12.
- The effects on the surrounding area of thermal runaway or other fire in one or more battery cabinets.
- Best effective spacing between units to resist spread of fire from one cabinet to another.
- Pre-planned evacuation radius in the event of fire in one or more cabinets.
- Any pre-installed suppression systems recommendations.
- Recommendations on methods to segregate the site to limit fire spread.
- Runoff containment for any water used in suppressing a fire at this site.
- How to deal with the risk that a fire could cut VC effectively into three parts without a way to move between them.
- Other issues that may come up in the course of investigating the above.

Further, the Project will comply with applicable San Diego County Department of Environmental Health requirements, including preparation of and updates to a Hazardous Materials Business Plan (HMBP), if required by the quantity and types of hazardous materials handled as part of the Project. If required, the HMBP will include:

- Including tracking manufacturers and batch numbers for each battery in the system (including replacements). Battery replacement program must report details on all replacements to FAHJ as a condition of permit.
- Yearly training for local fire crews.
- Yearly inspections and operational permit requirements.
- Property must be annexed into the CFD 2008-01.



## **4.5 Fire Fuel Assessment**

There is a small area of native vegetation within the northern portion of the site. The area currently has a mixture of So Cal-18 along with dead and down materials (see pictures Appendix B). The Developer will remove dead/downed vegetation onsite, as needed, as part of establishing an appropriate Project fuel modification zone. Any vegetation removal would be done utilizing methodologies that ensure potential sensitive resources are not impacted. Vegetation clearing associated with Project development, including a minimum of a 30-foot setback between the containers and the property boundary, will be maintained and kept clear of weeds and flammable vegetation. The agricultural farmland to the east and south of the Project site is growing ornamental eucalyptus and they are kept in a healthy state. Setbacks provided from the Project's property line and the eucalyptus trees provides inherent mitigation against fire risk. This is further assisted by compliance with the District's request to provide a wall or fencing around the site in lieu of landscaping. The surrounding homes appear to follow VCFPD's weed abatement codes and ordinances.

## **4.6 Predicting Wildland Fire Behavior**

"Can wildland fire behavior really be predicted? The minute-by-minute movement of a wildland fire will probably never be totally predictable—certainly not from weather conditions forecast many hours before the fire. Nevertheless, practice and experienced judgement in assessing the fire environment, coupled with a systematic method of calculating fire behavior, yields surprisingly good results" (Rothermel, 1983).

The BEHAVEPLUS: Fire Behavior Prediction and Fuel Modeling System by Patricia L. Andrews is one of the best systematic methods for predicting wildland fire behavior. The BEHAVEPLUS fire behavior computer modeling system was developed by USDA—Forest Service research scientists at the Intermountain Forest Fire Laboratory, Missoula, Montana, and is utilized by wildland fire experts nationwide. "Because the model was designed to predict the spread of a fire, the fire model describes the fire behavior only within the flaming front. The primary driving force in the fire behavior calculations is the dead fuel less than one-fourth inch in diameter; these are the fine fuels that carry the fire. Fuels larger than three inches (3") in diameter are not included in the calculations at all" (Andrews, 2011).

The BEHAVEPLUS fire model describes a wildfire spreading through surface fuels, which are the burnable materials within six feet (6') of the ground and contiguous to the ground.

Regardless of the limitations expressed, experienced wildland fire managers can use the BEHAVEPLUS modeling system to project the expected fire intensity, rate-of-spread and flame lengths with a reasonable degree of certainty for use in Fire Protection Planning purposes. Santa Margarita Consulting, LLC's evaluation team used the computer based BEHAVEPLUS Fire Behavior Prediction Model to make the following fire behavior assessments for the Project.

#### 4.6.1 Wildland Fire Behavior Calculations for the Off-Site Vegetative Fuels

Wildland fire behavior calculations have been projected for the vegetative fuels on the undeveloped areas in proximity to the Project site. The projections are based on scenarios that are “worst-case” San Diego County fire weather assumptions. The scenarios are depicted in Tables 1 through 3. The tables display the expected Rate of Fire Spread (expressed in feet per minute), Fireline Intensity (expressed in British Thermal Units per foot per second), and Flame Length (expressed in feet) for four separate BEHAVEPLUS–Fire Behavior Prediction and Fuel Modeling System Computer Calculations. The tables also include the calculation inputs used in the BEHAVEPLUS program which were obtained from Project site observations and fuel levels typically observed during the local fire season.

##### **Fire Scenario #1: Late Fire Season With Late Season North, Northeast And East Wind (Santa Ana Wind) Conditions Along Northeast & North Project Boundary**

<b>Table 1</b> <b>Fire Scenario #1</b> <b>Expected Fire Behavior for Late Season 60 MPH Santa Ana Wind Condition Fire</b> <b>Burning in a SCAL Fuel Model 18</b>	
<b>Rate of Spread</b>	<b>289 feet/minute</b>
<b>Fireline Intensity</b>	<b>20996 BTU's/foot/second</b>
<b>Flame Length</b>	<b>43.8 feet in length</b>
<b>Fire Behavior Calculation Input Data:</b> <ul style="list-style-type: none"><li>• 10 percent across slope</li><li>• 60 mph 20-foot wind speed (24 mph mid-flame wind speed)</li><li>• 360° direction of wind vector to slope</li></ul> <b>Anticipated Fuel Moistures</b> <ul style="list-style-type: none"><li>* 1-Hour Fine Fuel Moisture of .....2%</li><li>* 10-Hour Fuel Moisture of.....3%</li><li>* 100-Hour Fuel Moisture of ..... 5%</li><li>* Live Herbaceous Fuel Moisture of.....30%</li><li>* Live Woody Fuel Moisture of.....50%</li></ul>	

Table 2 which follows, shows the change in fire rate of spread, intensity and flame length following the completion of the “Fire Protection Plan” required fuel modification work within the minimum 30-ft setback between containers and the property boundary. The table displays the results of using two different fuel models (FM). FM-1 is a perennial native grass stand one (1) foot tall. In addition, native grasses must be removed from beneath the shrubs to eliminate vertical fuel ladders. The data in red displays the additional reduction in rate of spread, intensity and flame length when annual treatment (mowing and/or weed eating) is conducted after the grasses have headed out and cured. Treatment is typically completed in May or June each year.

**Fire Scenario #2: Late Fire Season With Late Season North, Northeast and East Wind (Santa Ana Wind) Conditions Along Northeast & East Project Boundaries**

<b>Table 2</b> <b>Expected Fire Behavior for a Late Season 60 MPH Santa Ana Wind Condition In Fuels Modified to a FIREWISE Non-irrigated Zone 2 Criteria Fuel Model (Fuel Model 1 – Native Grasses 100%).</b>	
<b>Rate of Spread</b>	<b>732 feet/minute</b>
<b>Fireline Intensity</b>	<b>1415 BTU's/foot/second</b>
<b>Flame Length</b>	<b>12.7 feet in length</b>
<b>Fire Behavior Calculation Input Data:</b> <ul style="list-style-type: none"> <li>• 10 percent across slope</li> <li>• 60 mph 20-foot wind speed (24 mph mid-flame wind speed)</li> <li>• 360° direction of wind vector to uphill slope</li> </ul> <b>Anticipated Fuel Moistures</b> <ul style="list-style-type: none"> <li>* 1-Hour Fine Fuel Moisture of .....2%</li> <li>* 10-Hour Fuel Moisture of.....3%</li> <li>* 100-Hour Fuel Moisture of .....5%</li> <li>* Live Herbaceous Fuel Moisture of.....30%</li> <li>* Live Woody Fuel Moisture of.....50%</li> </ul>	
<b>COMMENTS: The above fire behavior projections are based on grass fuels one-foot tall. Therefore, Rates of Spread, Fireline Intensity and Flame Lengths should be reduced two-thirds for 4-inch stubble grass fuels, i.e.,</b>	
<div> <b>Rate of Spread     =   242 feet/minute</b>  <b>Fireline Intensity =   467 BTU's/ft/sec</b>  <b>Flame Length      =   4.2 feet in length</b> </div>	

**Fire Scenario #3: Late Fire Season With Above Average Southwest Prevailing Wind Conditions Along Southwest Project Boundary**

Table 3	
<p align="center"><b>Fire Scenario #3</b>  <b>Expected Fire Behavior for Above Average 30 MPH Southwest Prevailing</b>  <b>Wind Condition Fire Burning in a Fuel Model 1</b></p>	
Rate of Spread	345 feet/minute
Fireline Intensity	607 BTU's/foot/second
Flame Length	8.6 feet in length
<b>Fire Behavior Calculation Input Data:</b> <ul style="list-style-type: none"> <li>• 10 percent across slope</li> <li>• 30 mph 20-foot wind speed (12 mph mid-flame wind speed)</li> <li>• 360° direction of wind vector to uphill slope</li> </ul> <b>Anticipated Fuel Moistures</b> <ul style="list-style-type: none"> <li>* 1-Hour Fine Fuel Moisture of .....2%</li> <li>* 10-Hour Fuel Moisture of.....3%</li> <li>* 100-Hour Fuel Moisture of ..... 5%</li> <li>* Live Herbaceous Fuel Moisture of.....30%</li> <li>* Live Woody Fuel Moisture of.....50%</li> </ul>	

Table 2 comments above (in red) simulate the change in fire rate of spread, intensity and flame length following the completion of the “Fire Protection Plan” required fuel modification work. The table displays the results of Fuel Model 1, a mature Grass Group community with a combined total of .74 tons (< 3-inch) of 1 hour fine fuel loading per acre. (See Appendix A).

**SUMMARY FIRE BEHAVIOR TABLE:**

**TABLE 1 – 60-mph Northeast Wind**

<u>Prior to Fuel Treatment</u>	
Rate of Spread	289 Ft/min
Fireline Intensity	20996 BTU/ft/sec
Flame Length	43.8 Feet

**TABLE 2 - 60-mph Northeast Wind**

<u>Before &amp; After Fuel Treatment</u>	
Rate of Spread	732 ft/min
Fireline Intensity	1415 BTU/ft/sec
Flame Length (Before)	12.7 Feet
Flame Length (After)	4.2 Feet

VS.

**TABLE 3 – 30-mph Southwest Wind**

<u>Prior to Fuel Treatment</u>	
Rate of Spread	345 Ft/min
Fireline Intensity	607 BTU/ft/sec
Flame Length	8.6 Feet

#### **4.7 Cumulative Impact Analysis**

The Project will be unmanned with no occupied buildings or structures, and the enclosures will be fixed with approved smoke, fire and heat detection. In its current vacant condition, the Project site presents more of a hazard as a vacant lot that could contribute to the spread of a wildfire. The site is zoned as Medium Impact Industrial. Uses in the Medium Impact Industrial zone are limited primarily to manufacturing, processing, and assembly; warehousing and distribution; large equipment supplies and sales; and other industrial or commercial activities. The M54 use regulation allows for unenclosed commercial and industrial operations having potential nuisance characteristics such as construction sales and services. The Project will not have the impact that a typical Medium Impact Industrial would on traffic and population in the community. The Project benefits the community because the energy stored in the Project will then be discharged into the grid when the energy is needed, providing important electrical reliability services to the local area.

The property shall be annexed into the CFD 2008-01.

## **Chapter 5. PROJECT DESIGN FEATURES AND CONSIDERATIONS**

The only wildland fire threat to the Project site is the vacant lot north of the site. The Project will remove the dead and downed material onsite and complete annual mowing of the weeds and brush. The Project site has been fire modeled at worst case scenario, (left untreated) to have a 44-foot flame length. A Santa-Ana wind driven fire would push the flames away from the Project site. Santa Margarita Consulting, LLC's team also ran the fuel models for a normal prevailing wind fire. The treated fuels, (FM-1) would only produce a flame length of 8.6 feet. The set-backs, vinyl fence and on-going maintenance of the northern portion of the Project site outside of the development footprint will make a wildland fire threat less than significant.

All improved areas of the Project site will be surfaced with gravel. The Project site will be kept clear of any accumulation of weeds and or grass, and no landscaping is proposed.

The BESS enclosures will be equipped with heat detection, fire detectors and an approved fire protection system. The enclosures are surrounded by gravel access roads and are set back from the property boundaries.

The Developer will prepare and submit the Technical Report to VCFPD as required. The information requested in the Technical Report, along with operational information such as contact information and process for updating the District when batteries are exchanged or replaced, will be developed and submitted to the District once the specific technology has been selected prior to operation of the Project.

Further, the Project preventative measures and state-of-the-art fire and safety systems, as described above, make a thermal runaway event very rare. Furthermore, in the unlikely event of thermal runaway, the Project's preventative measures and systems are designed to limit the event to a single battery module as well as reduce the duration and intensity of an event if it occurs. The Project is subject to the requirements of Chapter 12 of the 2019 California Fire Code and will utilize pre-engineered battery storage systems and equipment certified under UL 9540, the established Standard for Energy Storage Systems and Equipment. The UL 9540 rating establishes the design limit of a thermal runaway events to a single battery module.

## **Chapter 6. CONCLUSION**

This FPP demonstrates compliance with the applicable state and local fire regulations. It will ensure adequate compliance with codes/regulations and significance standards, including required fuel modifications and construction methods using fire resistive materials. In addition, it can be incorporated by reference into the Project's Final Conditions of Approval and enforced through the construction permit process. In its current vacant condition, the Project site presents more of a hazard as a vacant lot that could contribute to the spread of a wildfire. The amount of defensible space onsite, the ignition resistant containers, and the fencing will provide improved safety to the community.



## Chapter 7 LIST OF PREPARERS, PERSONS AND ORGANIZATIONS CONTACTED

### Persons contacted:

Dave Bacon of Wildfire Mitigation Strategies and Inspection

### Preparer:

Sid Morel of Santa Margarita Consulting, LLC.  
(760)-644-1104

#### PREPARED BY:

Santa Margarita Consulting, LLC

Sid Morel



---

Signature

President

---

Title

#### PROPERTY OWNER:

Valley Center ESS, LLC

Mark Turner



---

Signature

Vice President of Energy Storage  
Development

---

Title

## References

- Andrews, Patricia L. et al. (2013). Behave Fire Modeling System.
- Bade, G. (2016). *Inside construction of the worlds largest lithium Ion battery storage facility.* San Diego : Utility Dive.
- Citygate Associates, LLC . (2017). *Standards of Coverage Study* . Folsom.
- County of San Diego. (2011). *General Plan*. Kearny Mesa: County of San Diego .
- Department of Planning and Land Use, Department of Public Works . (2010). *County of San Diego, Guidelines for Determining Significance, Wildland Fire and Fire Protection* . San Diego: County of San Diego, Planning and Developmental Services .
- Jones, H. (2013). Paradise fire remembered a decade later. *San Diego Union*.
- Nikolewski, R. (2018, June 4). SDG&E to add 5 new battery storage facilities. *San Diego Union*.
- Partner. (2019). *Phase 1 Environmental Site Assessment Impact Report* . Torrance : Partner.
- Rothermel, R. C. (1983). *How to Predict the Spread and Intensity of Forest and Range Fires*. Ogden: United States Department of Agriculture, Forest Service .
- San Diego County Fire Marshals. (2017). *County of San Diego 2017 Consolidated Fire Code* . San Diego: San Diego County Planning and Development Services .
- Valley Center Fire Protection District . (2020). *Valley Center Fire Protection District* . Valley Center.

## APPENDIX A

BehavePlus 5.0.5 (Build 307)

FM 1 SW 30 mph

Tue, Mar 31, 2020 at 07:58:49

### Input Worksheet

#### Inputs: SURFACE

Input Variables	Units	Input Value(s)
<b>Fuel/Vegetation, Surface/Understory</b>		
Fuel Model		1
<b>Fuel Moisture</b>		
1-h Moisture	%	4
10-h Moisture	%	
100-h Moisture	%	
Live Herbaceous Moisture	%	
Live Woody Moisture	%	
<b>Weather</b>		
Midflame Wind Speed (upslope)	mi/h	12
<b>Terrain</b>		
Slope Steepness	%	10
<b>Notes</b>		

### Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

### Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	345.1	ch/h
Fireline Intensity	607	Btu/ft/s
Flame Length	8.6	ft

## APPENDIX A

BehavePlus 5.0.5 (Build 307)  
 Vly Ctr BESS NE 60 mph  
 Mon, Mar 30, 2020 at 14:30:30

### Input Worksheet

#### Inputs: SURFACE

Input Variables	Units	Input Value(s)
<b>Fuel/Vegetation, Surface/Understory</b>		
Fuel Model		SCAL18
<b>Fuel Moisture</b>		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
<b>Weather</b>		
Midflame Wind Speed (upslope)	mi/h	24
<b>Terrain</b>		
Slope Steepness	%	10
<b>Notes</b>		

### Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

### Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	289.0	ft/min
Fireline Intensity	20996	Btu/ft/s
Flame Length	43.8	ft

## APPENDIX A

BehavePlus 5.0.5 (Build 307)

Vly Ctr BESS NE 60 mph Treated

Mon, Mar 30, 2020 at 14:39:32

### Input Worksheet

#### Inputs: SURFACE

Input Variables	Units	Input Value(s)
<b>Fuel/Vegetation, Surface/Understory</b>		
Fuel Model		1
<b>Fuel Moisture</b>		
1-h Moisture	%	2
10-h Moisture	%	3
100-h Moisture	%	5
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
<b>Weather</b>		
Midflame Wind Speed (upslope)	mi/h	24
<b>Terrain</b>		
Slope Steepness	%	10
<b>Notes</b>		

### Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

### Results

Output Variable	Value	Units
Surface Rate of Spread (maximum)	732.1	ft/min
Fireline Intensity	1415	Btu/ft/s
Flame Length	12.7	ft

## APPENDIX B



Sign Valley Center Road



Locked Site Access Gate - Access easement off of Valley Center Road



## APPENDIX B



Project Access Easement – off of Valley Center Road to Locked Site Access Gate



Neighbor - Cruise Party Rental Property



## APPENDIX B



Cruise Party Rentals Tent



On-site Catch Basin



## APPENDIX B



SE Corner of Cruise Party Rental Property



Looking West at Property Line of Cruise Party Rental Property



## APPENDIX B



On-site Vegetation along norther Property boundary



Looking West Along Cruise Party Rental Property Tent



## APPENDIX B



Large Pine at Entrance Gate

## APPENDIX B



Eastern Property Line



Eucalyptus Off-site Agriculture



## APPENDIX B



Eucalyptus Off-site Agriculture #2



Eucalyptus East of Property Boundary

## APPENDIX B



Looking at SW Property Line



Looking West at Developed Property



## APPENDIX B



Looking at North Property Line



Looking NE Toward Site Access Easement



## APPENDIX B



Well Head and Water Tank



Fire Hydrant Along Valley Center Road



## APPENDIX B



Hydrant Located at NE Corner of East Side Neighbor – Valley Center Road



Looking West at Single Family Resident

## APPENDIX C

### ORDINANCE NO. 54

#### **AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE VALLEY CENTER FIRE PROTECTION DISTRICT SETTING THE MAXIMUM SERVICE AVAILABILITY CHARGE FOR FIRE SUPPRESSION SERVICE WITHIN SAID DISTRICT**

The Board of Directors of the Valley Center Fire Protection District does ordain as follows:

##### **SECTION 1:**

WHEREAS, the Valley Center Fire Protection District was formed by voter approval on June 8, 1982, in compliance with Government Code Section 53972-53977 and County of San Diego Ordinance No. 6254 (new series); and

##### **SECTION 2:**

Pursuant to Section 4 of said Ordinance No.6254, the Board is empowered with the authority to increase the maximum availability charge stated in Section 1 of said ordinance by the percentage increase of the adjusted Consumer Price Index for the San Diego area as determined by the U. S. Department of Labor.

##### **SECTION 3:**

Pursuant to the authority vested in the Board of Directors of the Valley Center Fire Protection District, said Board does hereby find, resolve and determine that for the year ending December 31, 2018, the All Urban Index increased by 2.2% and that the maximum availability charge shall be as follows:

<b>Parcel, Class of Improvement to Property, Use of Property</b>	<b>Maximum Availability Charge</b>
Residential (5 acres or less).....	\$221.47 per dwelling unit
Residential Estate.....	\$221.47 for each dwelling unit plus \$22.17 for each additional acre over 5 to a maximum of \$442.93 for the land
Commercial, Industrial, Institutional.....	\$885.86 per building
Improved Agricultural.....	\$22.17 per acre or portion thereof

APPENDIX D

RESOLUTION NO. 2019-07

**RESOLUTION OF THE BOARD OF DIRECTORS OF  
THE VALLEY CENTER FIRE PROTECTION DISTRICT  
CONTINUING THE ANNUAL SPECIAL TAX LEVY FOR COMMUNITY  
FACILITIES DISTRICT NO. 2000-01 FOR TAX YEAR 2019-2020**

**WHEREAS**, the Board of Directors of the Valley Center Fire Protection District (the "Board"), has initiated proceedings, held a public hearing, conducted an election and received a favorable vote from the qualified electors relating to the levy of a special tax in a Community Facilities District, all as authorized pursuant to the terms and provisions of the "Mellow-Roos Community Facilities Act of 1982" being Chapter 2.5, Part 1, Division 2, Title 5 of the Government Code of the State of California. This Community Facilities District is designated as COMMUNITY FACILITIES DISTRICT NO. 2000-01 (The "Community Facilities District"); and,

**WHEREAS**, the Board of Directors, acting as the legislative body of the District, is authorized to annually determine the special tax to be levied which shall not exceed the maximum special tax calculated pursuant to the "Rate and Method" of apportionment.

**WHEREAS**, the maximum special tax rate section C states, "on each July 1, commencing July 1, 2002, the Maximum Special Tax per Benefit Unit shall be increased by 2 percent (%) of the amount in effect in the previous Fiscal Year".

**WHEREAS**, the Special Tax per Benefit Unit in Fiscal Year 2019 was \$4.18 and with the allowed 2 percent (%) increase shall be \$4.26 per Benefit Unit for the Fiscal Year 2019-2020.


**NOW THEREFORE, BE IT RESOLVED** that the Special Tax per benefit unit for the fiscal year 2019-2020 shall be \$4.26. **IT IS FURTHER RESOLVED** that this Resolution shall take effect 30 days from the date of its adoption and shall be publicly posted at the Valley Center Community Hall, the Valley Center Fire Protection District Administrative Office and the District's website, vcfpd.org.

**INTRODUCED, APPROVED AND ADOPTED** this 16<sup>th</sup> day of May, 2019.

**AYES:** Bell, HITCHCOCK, WOOD, O'CONNOR, ABRAMS

**NOES:** 0

**ABSENT:** 0

  
Phil Bell, President

  
Jeremy Abrams, Secretary



## APPENDIX E



### VALLEY CENTER FIRE PROTECTION DISTRICT

28234 Lilac Road, Valley Center, CA 92082  
(760) 751-7600 Fax (760) 749-3892  
Website: vcfpd.org



David Sibbet, Program Coordinator,  
SAN DIEGO COUNTY FIRE AUTHORITY

February 18, 2020

RE: PDS2020-IC-20-003

David:

VCFPD has reviewed the initial submittal for PDS2020-IC-20-003 and has the following comments / requirements:

- Full form Fire Protection Plan.
- Supply details on manufacturer and specifications for all equipment.
- Technical Report specifically from Klausbruckner & Associates to provide answers to these questions:
  - Failure Modes and Effects Analysis report as specified in CFC 2020 Chapter 12.
  - The effects on the surrounding area of thermal runaway or other fire in one or more battery cabinets.
  - Best effective spacing between units to resist spread of fire from one cabinet to another.
  - Pre planned evacuation radius in the event of fire in one or more cabinets.
  - Any pre installed suppression systems recommendations.
  - recommendations on methods to segregate the site to limit fire spread.
  - Runoff containment for any water used in suppressing a fire at this site.
  - How to deal with the risk that a fire could cut VC effectively into three parts without a way to move between them.
  - Other issues that may come up in the course of investigating the above.
- Hazardous Materials Business Plan
  - Including tracking manufacturers and batch numbers for each and every battery in the system (including replacements). Battery replacement program must report details on all replacements to FAHJ as a condition of permit.
- Yearly training for local fire crews.
- Yearly inspections and operational permit requirements.
- Property must be annexed into the CFD 2008-01.

Thank you

  
Jim Davidson  
Fire Marshal / Battalion Chief

Valley Center Fire Station 1  
28234 Lilac Road  
Valley Center, CA 92082

Valley Center Fire Station 2  
28205 N. Lake Wohlford Road  
Valley Center, CA 92082