PROJECT DESCRIPTION

Luna Valley Solar Project
Fresno County, California

February 17, 2020

Clearway

Luna Valley Solar I, LLC

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TABLES

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ACRONYMS AND ABBREVIATIONS

AC	alternating current
Applicant	Luna Valley Solar I, LLC
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
DC	direct current
ESS	energy storage system
ft.	feet
HVAC	heating, ventilation, and air conditioning
kV	kilovolt
LFP	lithium iron phosphate
LMO	lithium manganese oxide
LTO	lithium titanate oxide
MW	megawatt
NCA	nickel cobalt aluminum
NMC	nickel manganese cobaltO&M operations and maintenance
PCS	power conditioning station
PG&E	Pacific Gas and Electric
POI	Point of Interconnection
Project	Luna Valley Solar Project
PV	photovoltaic
RPS	Renewable Portfolio Standard
SCADA	Supervisory control and data acquisition
SB	Senate Bill
UCUP	Unclassified Conditional Use Permit
Westlands	Westlands Water District

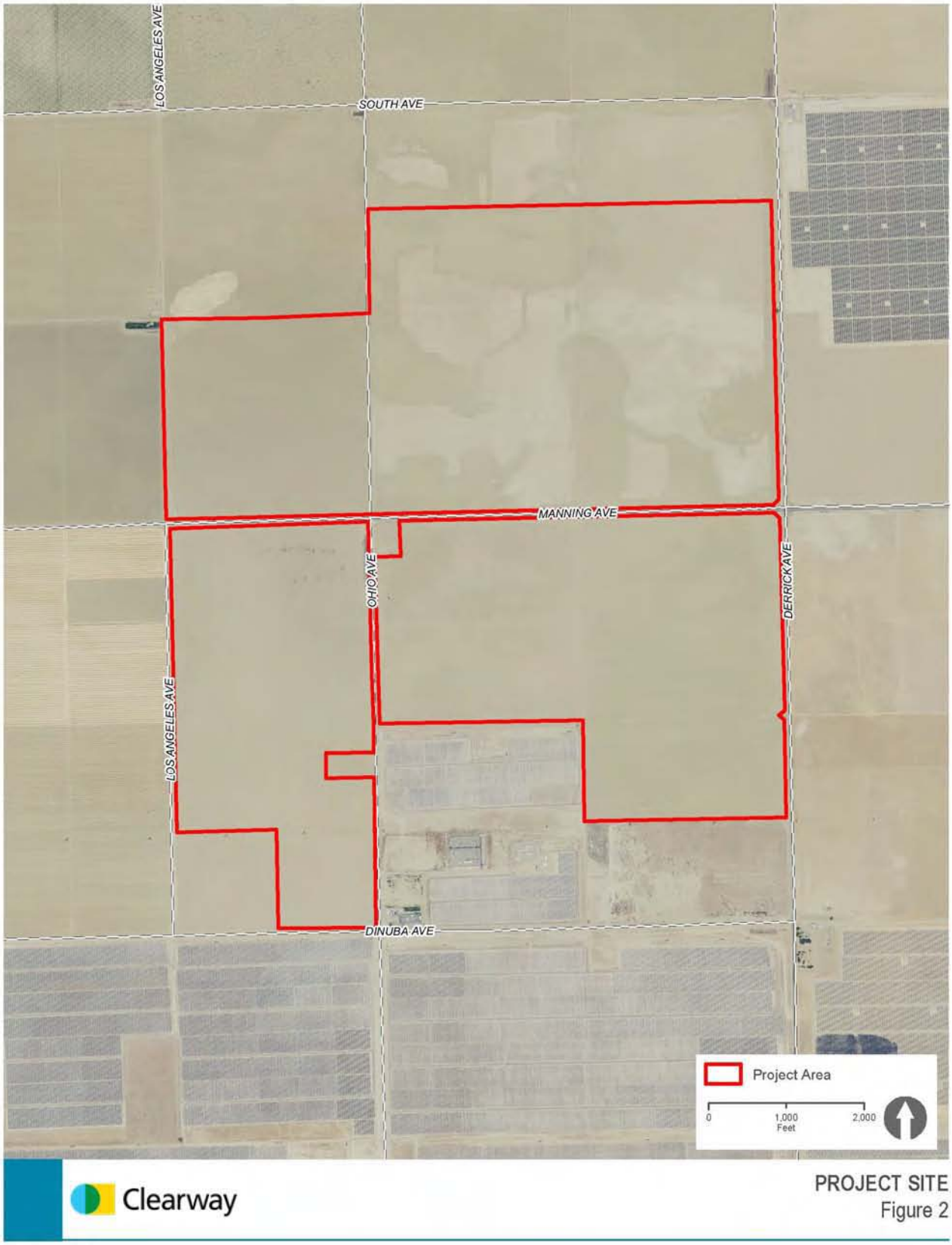
1.0 OVERVIEW

Luna Valley Solar I, LLC (Applicant) is proposing to develop, own, and operate the Luna Valley Solar Project (Project) in Fresno County, California, 9 miles west-southwest of the city of Tranquility within the unincorporated area of Levis (Figure 1). The Project consists of constructing and operating a photovoltaic (PV) solar electricity generating facility and energy storage system (ESS) and associated infrastructure that would produce up to 200 megawatts (MW) of alternating current (AC) energy at the point of electrical grid interconnection on approximately 1,300 acres of privately owned agricultural land (Figure 2) in western Fresno County. The Project would include the construction of solar arrays, an electrical substation and electrical interconnection facilities, an energy storage system and other necessary infrastructure including an operation and maintenance (O&M) building, septic system and leach field, a supervisory control and data acquisition (SCADA) system, a meteorological data system, buried conduit for electrical wires, overhead collector lines, on-site access roads and security fencing. .

The Project area is zoned Exclusive Agriculture AE – 20, Exclusive Agriculture; 20-acre minimum parcel size. Within this zoning district, the County permits utility-scale solar energy uses with an Unclassified Conditional-Use Permit (UCUP). The Applicant selected the Project site based on its previously disturbed nature and close proximity to electrical infrastructure and designed the Project in accordance with state and county regulations.

Figure 1. Project Location

Figure 2. Project Site



2.0 PROJECT OBJECTIVES

The Applicant is proposing to construct the Project to meet the following objectives:

- Establish a PV solar power-generating facility of a sufficient size and configuration to produce up to 200 MW (AC) of electricity at the Point of Interconnection (POI) in a cost-competitive manner;
- Assist California utilities in meeting their obligations under California's Renewable Portfolio Standard (RPS) Program and Senate Bill 100 (SB 100), which calls for 100 percent of all electricity sold in California to be generated from renewable sources by the year 2045, including 60 percent renewables by 2030;
- Assist California utilities in meeting their obligations under the CPUC's Energy Storage Framework and Design Program;
- Provide for the economically viable and environmentally beneficial use of the site's physically impaired agricultural capacity;
- Provide a utility-scale solar generation facility on highly disturbed lands that provide minimal habitat value for wildlife;
- Develop sites in close proximity to transmission infrastructure in order to minimize environmental impacts; and
- Facilitate grid integration of intermittent and variable PV solar generation and minimize line losses associated with off-site storage by collocating battery storage at the PV solar facility site.

3.0 PROJECT LOCATION AND SITE HISTORY

3.1 LOCATION

The Project site is located in unincorporated Fresno County and generally bound by flat, agricultural lands and other solar energy generation facilities. The nearest city is Tranquility, approximately 9 miles to the east-northeast. Interstate 5, paralleled to the east by the California Aqueduct, is approximately 11 miles to the west as well as to the south of Project area. The cities of Mendota and San Joaquin are approximately 10 miles north and east of Project area, respectively. The San Joaquin Airport is roughly 9.5 miles east of the Project area.

More specifically, Highway 33 (South Derrick Avenue) makes up the eastern boundary of the Project area. The western edge of the Project area is approximately 2,600 ft. (feet) east of S. Bernardino Avenue, the northern edge is approximately 1,400 ft. south of W. South Avenue, and the southern edge is approximately 1,300 ft. north of W. Dinuba Avenue. W. Manning Avenue cuts through the approximate middle of the Project area from east to west and S. Ohio Avenue cuts through the approximate middle of the Project area from north to south.

The Project site is entirely within the U.S. Geological Survey 7.5-minute topographic quadrangle of Levis. The Project area is located within Township 15 South, Range 14 East, Sections 23, 24, 25, and 26. The Project site is located approximately within the latitudes of 36.59° and 36.61° and within the longitudes of -120.39° and -120.42° (in decimal degrees). The Project area centroid is located at approximately latitude/longitude 36°36'12"N/120°24'05"W (WGS1984).

Figure 1 displays the Project location.

3.2 SITE HISTORY

The Project is located on lands owned by Westlands Water District (Westlands). Westlands acquired this property as part of the September 3, 2002 settlement agreement reached among the United States, Westlands, and others in the *Sumner Peck Ranch et al. v. Bureau of Reclamation et al.* lawsuit.

The Project site is located in an area of agricultural land use and identified as Farmland of Local Importance on the State Important Farmlands maps. In Fresno County, farmland of local importance includes all farmable lands that do not meet the definitions of Prime, Statewide, or Unique farmland. The site has historically been used for dry-farmed (non -irrigated) agriculture (low-yield production of winter wheat and oats) and has been used for this purpose for the last 10 years. Agricultural land in this area has been documented to contain relatively high levels of selenium and a water table that does not provide sufficient drainage for commercially irrigated crops. During years in which rainfall is insufficient to produce crops, the land is grazed as rangeland grasses. Currently, some portions of the Project area lie fallow while the majority of the area is used to grow livestock fodder such as alfalfa. None of the land within the Project site is covered by a Williamson Act Contract.

Highway 33, the eastern boundary of the Project area, extends from Ventura County in the south to San Joaquin County in the north. Designated as a state highway in 1934, Highway 33 traverses a desolate area of the Central Valley between instate 5 and highway 99. Highway 33 traffic was significantly reduced as a result of Interstate 5 development.

3.2.1 Historic Water Use

Project site parcels have historically been used for non-irrigated, dry-farming of crops such as wheat and alfalfa (Table 1). Crop yield data for the Project site parcels is not available but would be consistent with regional dry farming yields. During dry years with insufficient rainfall for crop production, parcels were

fallow or used for grazing. Only one parcel (028-60-72ST) has a well. The well is located at 36° 36′ 13.22″ N/ 120° 24′ 22.67″ W. However, the well is currently non-operational and the water table is estimated at 995 feet below the surface of the ground. All other water used within the Project site parcels is provided from the water district.

Table 1. Historic Water Use

Assessor's Parcel Number	Irrigation Covenant	Historical Ag Use (if none within past 10 years, specify what was last in ag use)	Crop Types (10 years)	Source of water for parcel (irrigation district, well(s), conjunctive system)	Well Onsite?
028-060-34T	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-060-69ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-060-70ST	No	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-60-71ST	No	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-60-72ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	Yes
028-101-15ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-17ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-19ST	No	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-29ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-58ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-65ST	No	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-69ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-72ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-74ST	Yes	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No
028-101-77ST	Unknown	Fallowed Dry Farmed non irrigated	Wheat, alfalfa seed, Grazing	Irrigation District	No

Source: Westlands

4.0 PROJECT SITE – PARCELS TO BE DEVELOPED

Table 2 shows the assessor's parcel numbers for the Project site.

Table 2. Project Site Assessor's Parcel Numbers

028-060-34T	028-101-15ST	028-101-65ST
028-060-69ST	028-101-17ST	028-101-69ST
028-060-70ST	028-101-19ST	028-101-72ST
028-060-71ST	028-101-29ST	028-101-74ST
028-060-72ST	028-101-58ST	028-101-77ST

5.0 SCHEDULE

The Project is scheduled to go through the permitting and the California Environmental Quality Act (CEQA) compliance process beginning the first quarter of 2020. Construction is anticipated to begin in 2022. The facility would begin operation in 2023.

6.0 SURROUNDING LAND USES AND CONDITIONS

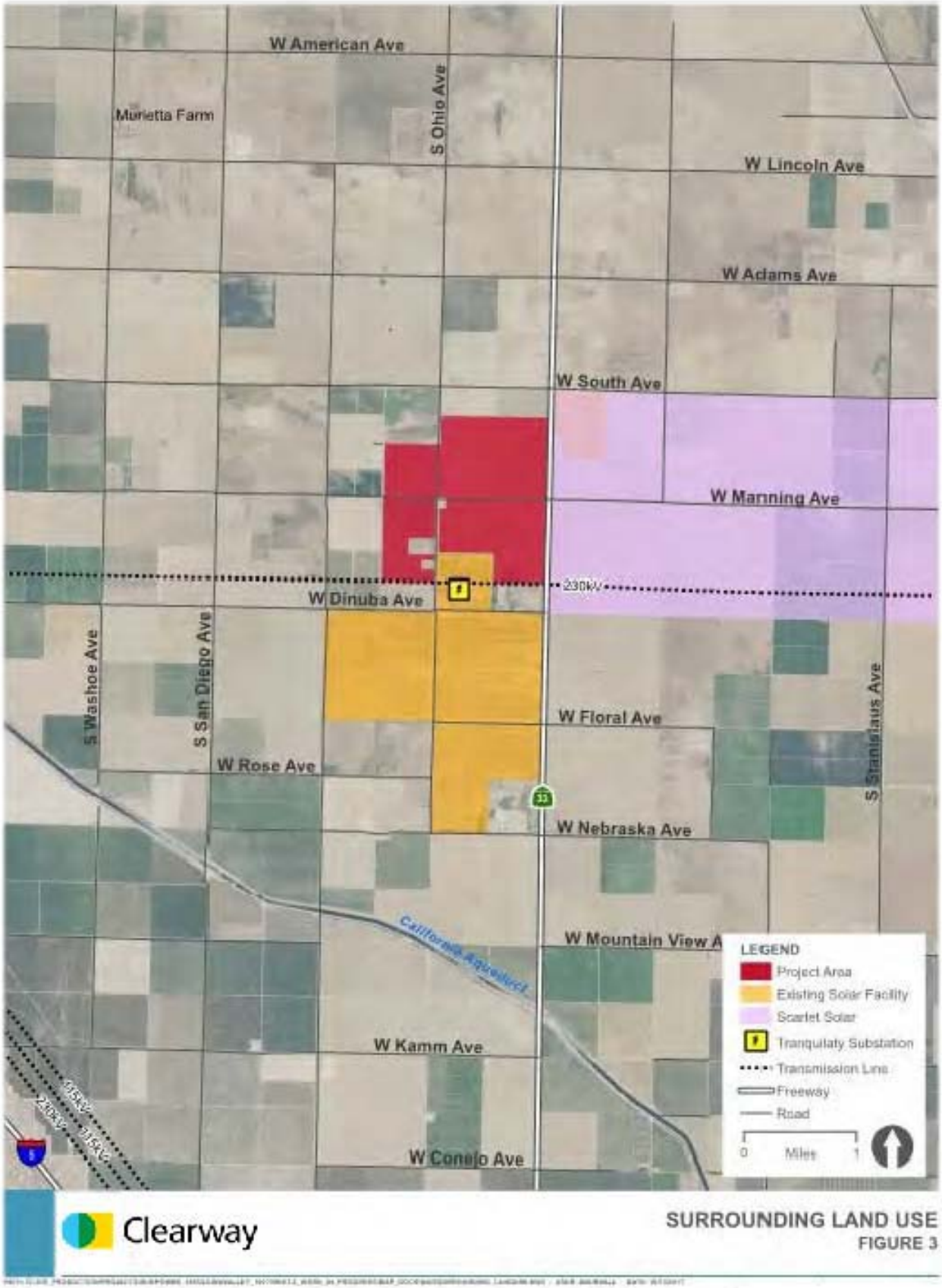
The Project site is largely surrounded by existing agriculture, including non-irrigated fields owned mostly by Westlands. The Project area is within an unincorporated area of the Central Valley, west of Fresno, designated for agricultural use.

In addition to the immediate agricultural use, the surrounding areas are mostly agricultural or undeveloped land with few residences. Several solar energy facilities are operating or under development in the immediate surrounding area, including the Tranquility and Scarlet projects. Also nearby are Interstate 5, the California Aqueduct, the San Joaquin Airport, and the cities of Mendota, Tranquility, and San Joaquin.

The AE-20 County zoning district permits utility-scale solar energy uses with a UCUP. The Project area is located within the Fresno County Fire Protection District and thus Project plans will be reviewed accordingly.

Figure 3 shows the land uses surrounding the Project area.

Figure 3. Surrounding Land Uses



6.1 LOCAL SETTING

The Project site is located within the Central Valley region of Fresno County. The region consists of a single broad, flat valley, drained by the San Joaquin River and its tributaries, bound by the Sierra Nevada to the east and the Coast Range to the west. The elevation ranges from about 150 to 450 feet above sea level. Historically, the dominant habitat types were arid grasslands and shrub lands with expansive Valley Oak riparian woodlands and freshwater emergent wetlands in the proximity of water sources. Today, most of the land has been converted for agricultural uses.

The Project site is in an unincorporated area of Fresno County 9 miles west-southwest of the city of Tranquility. Land use in the area is mostly agricultural interspersed with sparse rural residential development and solar energy facilities that are currently operating or under development. The nearest rural residences are located approximately 1,500 feet from the southeast corner of the Project site along Highway 33. Interstate 5, paralleled to the east by the California Aqueduct, is approximately 11 miles to the west as well as to the south of Project site. The cities of Mendota and San Joaquin are approximately 10 miles north and east of Project site, respectively. The San Joaquin Airport is roughly 9.5 miles east.

The Project site is within the Fresno County Fire Protection District. The nearest fire station is in Tranquility at 25101 W. Morton Avenue.

According to data from the California Department of Conservation's Farmland Mapping and Monitoring Program, the Project site includes lands identified as Farmland of Local Importance. In Fresno County, Farmland of Local Importance includes all farmable lands that do not meet the definitions of Prime, Statewide, or Unique farmland. This includes land that is or has been used for irrigated pasture, dryland farming, confined livestock and dairy, poultry facilities, aquaculture, and grazing land. Currently, the Project site is used for dryland farming to grow livestock fodder such as alfalfa and some portions are now fallow.

According to the Natural Resources Conservation Service's Web Soil Survey, the Project site includes soils four types of soil. The soils are: Posochanet clay loam (approximately 40 percent of the site), Tranquility clay (approximately 30 percent of the site), Ciervo clay (approximately 30 percent of the site), and Calfax clay loam (less than 1 percent of the site).

Interstate 5 is the only major transportation route near the site. The Interstate runs north to south connecting southern California to northern California and the Pacific Northwest. Near the site, the Interstate veers slightly south-southeast and thus is approximately 11 miles to the west as well as to the south of Project area. Most roadways in the immediate Project area vicinity are unimproved or paved without curb or sidewalk improvements. West Manning, which cuts through the Project area, connects the cities of Tranquility and San Joaquin to Interstate 5. Highway 33, the eastern boundary of the Project area, connects the city of Mendota to the Interstate.

The nearest airport is the privately-owned San Joaquin Airport (CA32). The nearest major airport is the Fresno Yosemite International Airport, which is over 40 miles from the Project area.

The nearest military facility is approximately 30 miles to the southeast at the Naval Air Station in Lemoore.

7.0 COUNTY ZONING DISTRICT AND SOLAR GUIDELINES

7.1 GENERAL PLAN AND ZONING

The Project site is zoned AE – 20, Exclusive Agriculture; 20-acre minimum parcel size. This County zone designation permits a PV solar and energy storage facility with a UCUP.

7.2 SOLAR FACILITY GUIDELINES

Fresno County's Solar Facility Guidelines (as revised by the Board of Supervisors on May 21, 2013) set forth the County's policies for solar project development. The purpose of the guidelines is to help balance the development of solar projects with the need to "protect important farmlands and minimize impacts to existing agricultural operations."

The Project is designed with a buffer between the solar facility and adjacent agricultural fields. In compliance with the Guidelines, the Applicant will acknowledge the County's Right to Farm Ordinance and will record a Right to Farm Notice. To facilitate a possible return to agricultural uses after the life span of the Project, the Applicant will submit to the County a reclamation plan detailing the removal of Project improvements and specific measures to return the site to its condition prior to construction.

8.0 DETAILED PROJECT DESCRIPTION

8.1 FACILITIES AND DESIGN

8.1.1 Overview of Solar Technology

The Project would include a solar energy generating facility, direct current (DC) electricity to AC electricity power inverters and transformers or power conditioning stations, a Project on-site substation, battery ESS, and a connection to the PG&E-owned Tranquility substation. Major Project features are described below and displayed on the submitted Site Plan.

Other Project components include access roads, perimeter fences, telecommunications, a meteorological data collection system, signage, lighting, stormwater facilities, and an operations and maintenance building. These components are also all discussed in detail below.

8.1.2 Photovoltaic Modules and Support Structures

The solar facility would consist of PV solar modules arranged into arrays supported by a racking system and tracker units that track the sun (Figure 4). The PV modules on the trackers convert sunlight into electricity. When modules are mounted on tracking devices, they are referred to as trackers or tracker blocks. The trackers are organized in rows in a uniform grid pattern or solar array. The proposed Project would have multiple solar arrays interconnected to form a utility-scale PV system.

The modules may be constructed of glass encasing crystalline silicon, poly crystalline silicon, or thin film technology. The PV modules would be dark blue, almost black in color, with minimal light reflection. A plastic binding material and metal frame provides structural rigidity. The solar modules would be self-contained, durably constructed units designed to withstand exposure to the elements for a period of 35 years or greater. The solar modules deployed for use in the Project would be certified to comply with all industry standard quality testing. Modules would be electrically connected and grounded. The plant will be designed in accordance with local and state codes and regulations. The final panel selection would be determined at the detailed Project-engineering phase.

To support the trackers, the Project would utilize a single-axis tracking system designed to optimize power production of the modules by ensuring proper orientation to the sun both daily and seasonally. Metal piers driven into the ground by a pile-driving machine support the single-axis tracking systems. Pier placement begins with a precise surveyed layout, ensuring proper positioning of remaining tracker assembly parts. Affixed to the top of each pier is a pier cap and bearing assembly that supports and allows proper movement of the torque tube assembly. Single-axis tracking systems require a drive system that provides directional force to the torque tube. This can be accomplished with either a mechanical or hydraulic drive arm and tube assembly that “pushes and pulls” the torque arm through its range of motion or by a geared assembly that redirects rotational force to the tubes. Both approaches require a small geared motor or hydraulic system mounted on a pile support or pad strong enough to move the system through its daily range of motions.

The trackers would be separated by distances to accommodate maintenance personnel and design parameters that meet applicable Fresno County fire safety requirements. Modules would be organized in rows in a uniform grid pattern, with each row separated by approximately 15-25 feet (from post to post). The module and tracker features allow for a natural light regime between and under the modules, supporting the co-management of solar energy generation, agriculture, and wildlife.

Figure 4. Typical Tracker Panel and Pier Design

8.1.3 Power Conditioning Stations (Inverters and Transformers)

Individual PV tracker panels would be connected together in series to create a “string” of trackers carrying DC electricity using a combiner box. Inverters in the power conditioning stations (PCS) convert the DC electricity produced by the trackers to AC electricity. The PCS transformers then accumulate the AC electricity to the appropriate collection level voltage (34.5 kilovolt [kV]) for movement to the Project substation and eventual delivery to the electrical grid. The number of trackers connected to each of the PCS would vary with module output relative to inverter size and desired output from the PCS.

The Project will require approximately 62 PCS, depending on final design details. The number of trackers connected to each of the PCS varies with tracker output relative to inverter size and desired output from the PCS. The PCS would be placed strategically throughout the Project site and the inverters and transformers, as well as other electrical equipment that comprises each PCS, would be contained within electrical equipment enclosures.

The Project is proposing to use Power Electronics HEM 3430 inverters and transformers, or equivalent. Each inverter and transformer will be installed as per manufacturer’s requirements.

8.1.4 Substation

A substation located in the southwest corner of the Project area, adjacent to the ESS, would be constructed as part of the Project (as shown on the submitted Site Plan). The Project substation would

include transformers, breakers, switches, meters, and related equipment. The overall footprint of the Project substation is anticipated to be approximately 350 feet by 300 feet with gen-tie structures up to 150 feet in height. An emergency generator for use in the event that the regional transmission system fails would also be at the substation; this emergency generator would provide emergency power until the regional transmission system restores operations. The generator would be powered by propane or diesel and is estimated to be 49 kilowatts or less in size. An approximately 220-gallon fuel tank would be immediately adjacent to the generator.

The Project substation may also contain a control room building approximately 40 feet by 40 feet with an overall height of less than 15 feet. The substation would be surrounded by an 8-foot barbed wire chain-link fence to comply with electrical codes. The control room may be outside the fenced area.

The substation must have access to communication systems in the area to comply with Federal Energy Regulatory Commission/California Independent System Operator utility monitoring and control requirements. Compliance may be accomplished by underground lines, aboveground lines, or wirelessly.

8.1.5 Energy Storage System

ESS components are advantageous for renewable energy Projects because they allow energy to be reliably fed to the grid from an otherwise intermittent energy production source. The ESS is expected to be either located adjacent to the substation or distributed throughout the solar array at the inverter equipment pads or tracker rows. If batteries are located adjacent to the substation, they would be contained within either steel enclosures similar to a refrigerator-sized cabinet. The color of the metal enclosure has not yet been determined; it typically varies by manufacturer. If distributed throughout the solar array, the ESS would likely be contained within metal housings and electrically connected to the inverters at each of the equipment pads.

Up to 4 acres may be utilized for the ESS. The key components of the ESS are described below.

- Batteries. Individual lithium ion cells form the core of the ESS. Cells are assembled either in series or parallel connection, in sealed battery modules. The battery modules would be installed in self-supporting racks electrically connected either in series or parallel to each other. The operating rack-level DC voltage currently ranges between 700 and 1,500 volts. The individual battery racks are connected in series or a parallel configuration to deliver the battery storage system energy and power rating.
- Battery Storage System Enclosure and Controller. The battery storage system enclosure would house the batteries described above, as well as the battery storage system controller. The battery storage system controller is a multilevel control system designed to provide a hierarchical system of controls for the battery modules, PCS, medium voltage system, and up to the point of connection with the electrical grid. The controllers ensure that the battery storage system effectively mimics conventional turbine generators when responding to grid emergency conditions. The battery storage system enclosure would also house required heating, ventilation, and air conditioning (HVAC) and fire protection systems.
- DC/DC Converter. In a DC-coupled system, the DC/DC converter allows the connection of the battery storage system to the DC side of the photovoltaic inverter. The DC/DC converter manages the battery and PV bus voltage and provides appropriate protections for the PV inverter.
- PCS - Inverter. The PCS consists of an inverter, protection equipment, circuit breakers, air filter equipment, equipment terminals, and cabling. Electricity is transferred from the PV array (or power grid) to the Project batteries during a battery charging cycle and from the Project batteries to the power grid during a battery discharge cycle. The inverter is bi-directional, with the ability to convert power from 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. The inverter DC operating voltage would be between 700 and 1,500 volts, with a typical power rating of approximately

3,000 kW. The inverter AC operating voltage may be approximately 630 volts AC nominal. Voltage is increased to medium voltage levels (typically approximately 13–34.5 kV) when combined with a medium voltage transformer. Voltage and power ratings are specific to the equipment manufacturer and product model. The installed equipment would be selected at a later date and therefore is subject to change.

- Medium Voltage Transformer. A separate medium voltage transformer may be present if not integrated into the inverter skid. This would be a pad-mounted transformer used to increase voltage on the AC side of the inverter from low to medium voltage. Medium voltage transformers are used to increase the efficiency of power transmission, associated with reduced resistive power losses higher voltage.

The ESS would likely use one of several available lithium ion technologies, though alternatives may be considered (such as flow batteries) given continuing rapid technological change in the battery industry. In general, a lithium ion battery is a rechargeable battery consisting of three major functional components: a positive electrode made from metal oxide, a negative electrode made from carbon, and an electrolyte made from lithium salt. Lithium ions move from negative to positive electrodes during discharging and in the opposite direction when charging. Five major lithium ion battery sub-chemistries are commercially available:

- Lithium nickel cobalt aluminum (NCA)
- Lithium nickel manganese cobalt (NMC)
- Lithium manganese oxide (LMO)
- Lithium titanate oxide (LTO)
- Lithium iron phosphate (LFP)

Selection of the lithium ion sub-chemistry for the Project would take into consideration various technical factors, including safety, life span, energy performance, and cost.

The proposed ESS would be designed, constructed, operated, and maintained in accordance with existing federal, state, and local regulations for health and safety, including the 2016 California Fire Code. The Applicant would select batteries or ESS providers that comply with the application-specific codes, standards, and regulations for the siting, construction, and operation of lithium-ion stationary ESS.

The configuration of the safety system would be determined based on site-specific environmental factors and associated fire response strategy. The ESS would contain a safety system that would be triggered automatically when the system senses imminent fire danger. The fire safety system inside each enclosure will shut down the unit if any hazard indicators are detected. If the safety system detects a potential issue as detected by the smoke and temperature sensors, the batteries will be automatically deenergized by opening the electrical contacts, and HVAC units and fans are shut off. The enclosure wall is designed to contain the fire for at least 2 hours, providing sufficient time for the fire to die down and allow the system to cool. Fire responders are trained to monitor fire from a safe distance using infrared cameras until temperature of the affected enclosure cools to ambient temperature.

The Emergency Response Plan is used to train local emergency response personnel during development and operations of the facility. The plan will be completed in accordance with existing state regulations (Health and Safety Code [HSC] § 25504(b); 19 California Code of Regulations [CCR] §2731; 22 CCR §66262.34(a)(4)). The contents of the Emergency Response Plan would comply with existing state regulations and include the following components and involve training for the local fire responders:

- Developed in consultation with Fire Department and ESS Supplier
- Defined roles and responsibilities

- Potential emergency scenarios including fire
- On-site training of fire personnel and on-site Project staff
- Training for local first responders

8.1.6 PG&E Transmission Line

To interconnect the Luna Valley Solar Project to the PG&E Tranquility Switching Station, PG&E would extend the footprint of the existing Tranquility Switching Station north by approximately 100 feet and construct a new 230 kV transmission line that would extend from the Tranquility Switching Station to a structure located on the solar Project property. The PG&E transmission line would include approximately 1,300 feet of 230 kV conductor strung on approximately four new poles of up to 200 feet in height. The PG&E transmission line would also include underground fiber optic line for communications. Energy from the Project solar arrays will be collected at the Project substation, described above, and transmitted to the PG&E-owned Tranquility substation via PG&E transmission line, as shown on the submitted Site Plan.

8.1.7 Access Roads

Access to the Project area would be via main entrances along W. Manning Avenue and Highway 33 (S. Derrick Avenue). The Applicant plans to utilize existing interior access roads, however these roads may be improved with the addition of an aggregate base or other native material with a soil stabilization material, if necessary. Interior and perimeter access routes would be approximately 20 feet wide.

8.1.8 Perimeter Fencing

Chain-link fencing is proposed along the perimeter of the Project area. One foot of three-strand concertina wire may also be added to the perimeter fence if deemed necessary. Access gates would be provided at each site entry road.

8.1.9 Telecommunications

The Project would require connection with the existing local telecommunication service. A telecommunication line is comprised of fiber optic cable and/or 25-pair telephone line, which would be installed above and below ground, either attached to existing distribution lines or installed immediately adjacent to the Project substation. The telecommunication routes would use a combination of existing poles or new poles and below ground installations. Lines would be placed within utility franchise easements to the extent feasible. The POI to the existing telecom facilities would be in a small telephone/fiber optic vault. Interconnection to the Project would be within the Project substation. Below ground installations are usually installed 24-48 inches below grade. Aboveground lines are typically placed 6 feet below existing distribution lines or on new, adjacent wooden poles. Telecommunications may also be transmitted by a small wireless antenna, which would be placed at the Project substation.

8.1.10 Meteorological Data Collection System

The Project would require several meteorological data collection systems. The systems would include a variety of instruments to collect meteorological data, which would be mounted at various locations throughout the facility. The meteorological data would be collected at the level of the solar panels or approximately 10 feet above the ground.

8.1.11 Signage

Project signage is proposed to allow for the identification of the Project owner and for safety and security purposes. Signage is proposed to be installed on the fence or ground mounted in the vicinity of the main entry gates. Signage would identify the Project operator and owner and would provide emergency contact information. Small-scale signage would also be posted at the main entry gates and intermittently along

the perimeter fencing on all exterior parcel boundaries, to indicate “No Trespassing” and “Private Property” for security purposes. All signage would conform to Fresno County signage requirements.

8.1.12 Lighting

Limited lighting is proposed on the Project site. Lighting would be used from dusk to dawn. Project lighting would be installed to allow for ongoing maintenance and security. Low-level lighting may be installed at entry and egress gates and at other strategic locations around the facility. Manually controlled lights would be installed at equipment pads and substations. All Project lighting would be shielded and directed downward to minimize the potential for glare or spillover onto adjacent ownerships. All lighting would conform to applicable Fresno County outdoor lighting codes.

8.1.13 Stormwater Facilities

The site drainage is designed to follow the natural drainage pattern, and none of the on-site facilities, including fences and panel posts, should prevent stormwater flow. Therefore, the Applicant anticipates that the Project would have very limited impact on site drainage. No on-site detention facilities are planned.

8.1.14 Other Infrastructure

Operations and maintenance activities would take place in a new operations and maintenance building located near the southwest corner of the Project area (as shown on the submitted Site Plan). This building would be approximately 100 by 50 feet. Sanitary facilities for operations would be provided through the proposed operations and maintenance building to include a septic system or leach field. No additional wastewater or septic system facilities would be required. Water required during construction would be obtained from on-site wells or trucked in. Water requirements during operations would be negligible (that is, for occasional cleaning of solar panels).

8.1.15 Applicant-Proposed Best Management Practices

Various attributes and features of the Project serve to minimize negative effects on local land uses. These include the following.

8.1.15.1 Solar Technology – Glare and Lighting

The Project would use solar panels that have a low profile (typically 6 feet high, but generally no more than 13 feet high at the highest point during the day) to minimize visual impacts. These solar panels are designed to be anti-reflective.

Nighttime lighting impacts would be minimized by including only small lighting features that are equipped with on/off switches or motion detectors. The lighting impacts from such fixtures would be similar to those of domestic fixtures on local homes.

8.1.15.2 Noise Reduction

The only noise-producing Project feature—the inverters—would be placed away from the site boundaries to ensure that off-site areas do not experience noise levels exceeding County standards described in the Fresno County Noise Control Ordinance (Fresno County Code 8.40).

8.2 CONSTRUCTION

8.2.1 Site Preparation and Grading

Grubbing and grading would occur on the site to achieve the required surface conditions. Because the site is already mostly flat, grading would be minimal. The site's cut and fill would balance, and no importing or exporting of materials would be necessary.

After grading, temporary fences would be placed around the Project site, allowing materials and equipment to be securely stored on the site.

8.2.2 Construction Access Routes and Laydown Areas

Construction vehicles would access the Project site from Highway 33 or W. Manning Avenue.

During construction, materials would be placed within the Project boundaries adjacent to the then-current phase of construction. To prevent theft and vandalism, materials would be secured within fenced areas at all times. A storage container might be used to house tools and other construction equipment. In addition, security guards would regularly monitor the site. Portable toilet facilities would be installed for use by construction workers. Waste disposal would occur in a permitted off-site facility. Domestic water for use by employees would be provided by the construction contractor through deliveries to the site.

8.3 CONSTRUCTION ACTIVITIES AND EQUIPMENT

The Applicant anticipates that construction would occur during a period of approximately 18 months. The onsite construction workforce would consist of laborers, craftspeople, supervisory personnel, and support personnel. The onsite assembly and construction workforce is expected to reach a peak of approximately 300 workers; the average number of workers onsite is anticipated to be approximately 100 to 150. On average, it is anticipated that each worker will generate one round trip to the Project per workday. Most workers would commute to the site from nearby communities such as Mendota, Tranquility, or San Joaquin, with some traveling from more-distant areas such as Fresno, Visalia, or Hanford. Construction would occur primarily during daylight hours. Workers would reach the site using existing roads.

Project construction would consist of two major stages. The first stage would include site preparation, grading, and preparing staging areas and on-site access routes, and the second stage would involve assembling the trackers and constructing electrical interconnection facilities.

Onsite roads would be constructed with a scarified and compacted subgrade and coated to create a dustless or durable surface or surfaced with compacted gravel. At the footing for the PCS pads, existing soil would be scarified and recompacted following recommendations of the geotechnical report.

Placing solar panels will require driving steel piles about 6 to 10 feet into the ground. In areas where geotechnical analysis has determined that piles might not be feasible or cost-effective, conventional foundations (such as isolated spread foundations or continuous footings) might be used.

During construction, a variety of equipment and vehicles would operate on the Project site. All equipment and vehicles would comply with the noise requirements of the Fresno County Noise Control Ordinance (Fresno County Code 8.40).

Water for dust control and other construction needs would come from onsite wells or be trucked to the site.

8.4 OPERATIONS

Once constructed, the Project would operate seven days per week and 365 days per year. The facility would be operated by Luna Valley Solar I, LLC or an affiliated company. Approximately four, permanent on-site staff are anticipated. Security would be maintained through installation of a chain-link fence, which would include one- foot of three-strand concertina wire along the perimeter of the site. Existing barbed wire fencing would be replaced with the Project perimeter fencing as needed. Infrared security cameras, motion detectors, and/or other similar technology may also be installed to allow for monitoring of the Project site through review of live, 24/7 footage. A security company may also be contracted by the Applicant for security purposes during construction and operation. Should the security system detect the presence of unauthorized personnel, a security representative would be dispatched to the facility, and appropriate local authorities would be notified.

Operation and maintenance of the Project would generate minimal noise, primarily from fans used to cool electrical equipment and transformers. Considering the distance to the nearest residence, it is not expected that fans or transformers would be audible from any residential area.

Only occasional, on-site maintenance is expected to be required following commissioning. Initially, personnel would likely visit the Project area daily or weekly, but it is anticipated that eventually maintenance visits would be reduced to once a month or less. Operations and maintenance activities would require up to 4 workers performing visual inspections, monitoring plant performance, executing minor repairs, and responding to needs for plant adjustment. On intermittent occasions, the presence of 5 to 30 workers may be required for repairs or replacement of equipment, panel cleaning, and other specialized maintenance. However, due to the self-operating nature of the facilities, such actions would likely occur infrequently.

The expected maintenance would generate little traffic during operations. The areas surrounding the inverters and switchgear would be graveled and would have adequate space for parking several vehicles. Operations and maintenance vehicles would include light duty trucks (e.g., pickup, flatbed) and other light equipment for maintenance and module washing. Heavy equipment would not be utilized during normal operation. Large or heavy equipment may be brought to the facility infrequently for equipment repair or replacement or vegetation control.

Minimal water would be required for panel washing activities and general maintenance. The need for panel washing would be infrequent (e.g., months to years between washings) and determined based on operating considerations, including actual soiling of the PV panels and any expected benefit from cleaning. Should cleaning be necessary, demineralized water would be sprayed on the PV panels to remove dust or a dry cleaning method may be used.

Sanitary facilities for operations would be provided through the septic system at the proposed operations and maintenance building. Other wastes from equipment replacement or other work would be removed from the Site at the end of the day, or as needed.

Combustible vegetation or agricultural products on and around the Project boundary would be actively managed by the Project owner or its affiliates during both the construction and operation phases of the Project to minimize fire risk. Combustible products would be either limited in height or removed. Additionally, the Project would include firebreaks around the site boundary in the form of access roads subject to county standards.

8.5 DECOMMISSIONING

If operations at the site are terminated, the facility would be decommissioned. Most parts of the proposed system are recyclable. Panels typically consist of silicon, glass, and an aluminum frame. Tracking

systems typically consist of steel and concrete, in addition to motors and control systems. All of these materials can be recycled.

Numerous recyclers for the various materials to be used on the Project site operate in Fresno and other nearby counties. Metal, scrap equipment, and parts that do not have free-flowing oil can be sent for salvage. Equipment containing any free-flowing oil would be managed as waste and would require evaluation. Oil and lubricants removed from equipment would be managed as used oil, which is a hazardous waste in California. Decommissioning would comply with federal, state, county and other local standards and all regulations that exist when the Project is shut down.

9.0 PERMITS AND CONSULTATIONS

9.1 POTENTIAL PERMIT REQUIREMENTS

- **Fresno County** – UCUP, Variance for gen-tie pole height, Lot Line Adjustment, Lot Merger, Subdivision Map, and/or a Tentative Parcel Map
- **Central Valley Regional Water Quality Control Board** – General Permit for Discharges of Storm Water Associated with Construction Activity, Construction General Permit Order 2009-0009-DWQ, Section 401 Clean Water Act Permit, if required.
- **California Department of Fish and Wildlife** – Streambed Alteration Agreement, if required; Incidental Take Permit for state-listed species (ITP), if required.
- **United States Army Corps of Engineers** – Section 404 Clean Water Act Permit, if required.
- **United States Fish and Wildlife Services** – ITP for federally-listed species, if required.

9.2 CONSULTATIONS

- **San Joaquin Valley Unified Air Quality Management District** – comply with regulations; consult during the CEQA process
- **Fresno County Fire Protection District** – comply with regulations; consult during the CEQA process