

**JOINT POWERS AUTHORITY  
SOLAR GENERATION PROJECT  
RECYCLED WATER PUMP STATION**

**FINAL INITIAL STUDY AND  
MITIGATED NEGATIVE DECLARATION**

---

*Prepared for:*

**LAS VIRGENES – TRIUNFO JOINT POWERS AUTHORITY**  
4232 Las Virgenes Road  
Calabasas, CA 91302  
Contact: Mr. John Zhao, P.E.  
(818) 251-2100

*Prepared by:*

**ENVICOM CORPORATION**  
28328 Agoura Road  
Agoura Hills, California 91301  
Contact: Mr. Primo Tapia  
(818) 879-4700

March 27, 2013

This page intentionally left blank.

**SECTION**

<b>1.0</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>2.0</b>	<b>PROJECT DESCRIPTION</b>	<b>5</b>
<b>3.0</b>	<b>FINDINGS</b>	<b>11</b>
<b>4.0</b>	<b>INITIAL STUDY</b>	<b>19</b>
<b>5.0</b>	<b>DISCUSSION OF INITIAL STUDY ENVIRONMENTAL CHECKLIST</b>	<b>32</b>
5.1.	Aesthetics	32
5.2	Agriculture	44
5.3.	Air Quality	46
5.4.	Biological Resources	52
5.5	Cultural Resources	63
5.6	Geology and Soils	64
5.7.	Greenhouse Gas Emissions	66
5.8.	Hazards and Hazardous Materials	68
5.9.	Hydrology and Water Quality	70
5.10.	Land Use and Planning	74
5.11	Mineral Resources	77
5.12.	Noise	78
5.13	Population and Housing	83
5.14	Public Services	84
5.15	Recreation	86
5.16	Transportation/Traffic	87
5.17	Utilities and Service Systems	91
5.18	Mandatory Findings of Significance	93
<b>6.0</b>	<b>RESPONSES TO COMMENTS TO DRAFT MND</b>	<b>95</b>
<b>7.0</b>	<b>PREPARERS AND REFERENCES</b>	<b>102</b>

**FIGURES**

Figure 2-1	Vicinity Map	6
Figure 2-2	Project Site	7
Figure 5.1-1	Viewpoint Photo Location Map	37
Figure 5.1-2	Photographs of the Project Site	39
Figure 5.4-1	Vegetation and Land Cover Map	53
Figure 5.4-2	Representative Photographs of Site Conditions	54

**TABLES**

Table 5.3-1	Construction Activity Emissions Maximum Daily Emissions (pounds/day)	48
Table 5.3-2	Localized Significance Thresholds (LST) and On-Site Construction Emissions	49
Table 5.12-1	Effects of Groundborne Vibration	81
Table 5.16-1	City of Calabasas Traffic Impact Thresholds	87

**APPENDICES**

Appendix A	Air Quality and Greenhouse Gas Emissions Modeling Report (CalEEMod)
Appendix B	Biological Resources
Appendix C	Proposed Solar Panel Alignment
Appendix D	Proposed Solar Panel Tracker Elevation Profile
Appendix E	Proposed Solar Panel Cross Section
Appendix F	Potential Impacts from Reflection of Proposed Calipatria Solar Farm I & II

## 1.0 INTRODUCTION

This Final Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared pursuant to the applicable provisions of the California Environmental Quality Act (CEQA) and its implementing guidelines, known as the CEQA Guidelines. The Draft IS/MND was circulated for public review and comment from February 25, 2013 to March 26, 2013. This document consists of an update of the Draft IS/MND based upon comments received during its public circulation period as well as responses to those comments. Additions made to this document are underlined, while deletions are shown in strike thru. The IS/ND examines potential physical impacts to the environment as a result of implementation of the proposed Joint Powers Authority Rancho Recycled Water 1 MW Solar Generation Project (project) to construct and operate a solar powered renewable energy electrical generation facility to supply electricity for an existing recycled water pump station. The existing pump station is operated by the Joint Powers Authority (JPA), which provides for the cooperative treatment of wastewater from the Las Virgenes Municipal Water District (LVMWD) and the Triunfo Sanitation District (TSD). This IS/MND is to inform the JPA (as the lead agency for the proposed project), the City of Calabasas, the County of Los Angeles, other responsible agencies, and the public, of the proposed project's environmental effects that may be significant and adverse, as well as describing regulations and/or mitigations that would lessen or eliminate such impacts.

### 1.1 BACKGROUND

The JPA generates recycled water supplies from the Tapia Water Reclamation Facility (Tapia WRF) located near the intersection of Piuma Road and Malibu Canyon road. The existing recycled water system includes pipelines from the Tapia WRF that extend to a reservoir (Reservoir No. 2) and the recycled water pumping station located at LVMWD headquarters at 4232 Las Virgenes Road in the City of Calabasas. From this location, recycled water is pumped to the various sub-systems and distribution networks to be used for irrigation purposes. The recycled water pump station consumes more than 5.4 million kilowatt hours (kWh) of electricity annually. Electricity supplies to power the pumping station is provided by Southern California Edison. This electricity use could increase as the JPA plans for expanding the use of recycled water.

This project proposes to develop a 1 MW solar generating facility to provide electricity for the electric pumps currently being used at the LVMWD headquarters located on Las Virgenes Road. The project is being proposed to reduce the amount of electricity that must be purchased from SCE to operate the recycled water pumps with the goal of offsetting approximately 50 percent (2.4 million kWh) of the facility's current electricity demand. The project would be located on land that is known as Rancho Las Virgenes, which is owned by the JPA. Implementation of the project would enable JPA to operate its recycled water distribution facilities in a more energy-efficient and cost-effective manner, by replacing electricity supplies currently provided by Southern California Edison (SCE) with renewable energy generated onsite, thereby reducing carbon emissions and reducing expenses for electricity use.

## **1.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) AUTHORITY TO PREPARE A NEGATIVE DECLARATION**

The JPA is the lead CEQA agency responsible for the review and approval of the proposed 1 MW solar generation project. Based on the findings of the Initial Study the lead agency has made the determination that a Mitigated Negative Declaration (MND) is the appropriate environmental document to be prepared in compliance with CEQA. As provided for by CEQA §21064.5, a MND may be prepared for a project subject to CEQA when an Initial Study has identified potentially significant effects on the environment but revisions in the project have been made and as a result there is clearly no significant effect on the environment that would occur.

This ~~Draft~~ Final MND has been prepared in conformance with Section 15070, subsection (a), of the State of California Guidelines. The purpose of the MND and the Initial Study Checklist is to determine any potentially significant impacts associated with the proposed project and incorporate mitigation measures into the project design as necessary to reduce or eliminate the significant or potentially significant effects of the project.

## **1.3 OTHER AGENCIES THAT MAY USE THE MITIGATED NEGATIVE DECLARATION**

This MND is intended to be used by responsible and trustee agencies that may have an interest in review of the project including, but not limited to the City of Calabasas. The JPA would obtain all permits as required by law.

## **1.5 PUBLIC REVIEW PROCESS**

In accordance with CEQA, a good faith effort has been made during the preparation of this MND to contact affected agencies, organizations and persons who may have an interest in this project.

In reviewing the MND, affected public agencies and the interested public should focus on the sufficiency of the document in identifying and analyzing the possible impacts on the environment. A copy of the draft MND and related documents are available for review at LVMWD headquarters located at 4232 Las Virgenes Road in Calabasas during regular business hours. The draft MND will also be available for review at the Calabasas Library located at 200 Civic Center Way, Calabasas, 91302 (call 818-225-7616 for library hours).

Comments may be made on the MND in writing before the end of the public review period. A 30-day review and comment period from February 25, 2013 to March 26, 2013 has been established in accordance with Sections 15072(a) of the CEQA Guidelines. Following the close of the public comment period, the lead agency will consider this MND and comments thereto in determining whether to approve the proposed project.

Written comments on the MND should be sent to the following address by 5:00 p.m., March 26, 2013:

LVMWD  
4232 Las Virgenes Road  
Calabasas, CA 91302  
Contact: John Zhao, P.E.  
Telephone: (818) 251-2100

This page intentionally left blank.

## 2.0 PROJECT DESCRIPTION

### 2.1 PROJECT LOCATION

The JPA is proposing to construct a one-megawatt (1 MW) solar power electricity generation facility at a location known as the north canyon of its Rancho Las Virgenes property, which lies approximately 1,500 feet south of the LVMWD headquarters and recycled water pump station. The project site property is owned by the JPA and is located in the City of Calabasas, east of Las Virgenes Road, along a segment between the intersection of Meadow Creek Lane and A.E. Wright Middle School.

The project site is regionally located approximately 30 miles northwest of downtown Los Angeles, and is located within a portion of Sections 30 and 31, Township 1 North, Range 17 West as shown on the USGS 7.5' Calabasas Quadrangle. Regional access to the project area is via the Ventura Freeway (US 101) and the proposed project location is approximately 1.15 miles south of US 101 along the east side of Las Virgenes Road. The subject property lies immediately south of the Calabasas Bark Park<sup>1</sup>, which is located at 4232 Las Virgenes Rd. The project site property is identified by the Los Angeles County Assessors Office as APN numbers 2069-011-904 and 4455-025-900. A component of the project is a proposed underground electrical transmission line to link the project site to the recycled water pump facility located at the LVMWD headquarters. This proposed transmission line is described below in Section 2.3 and would be routed through properties identified by APN numbers 2069-011-901, -902, -905, -906, and -907. All of these parcels are owned by the JPA. **Figure 2.1** provides a project location map with regional and local context.

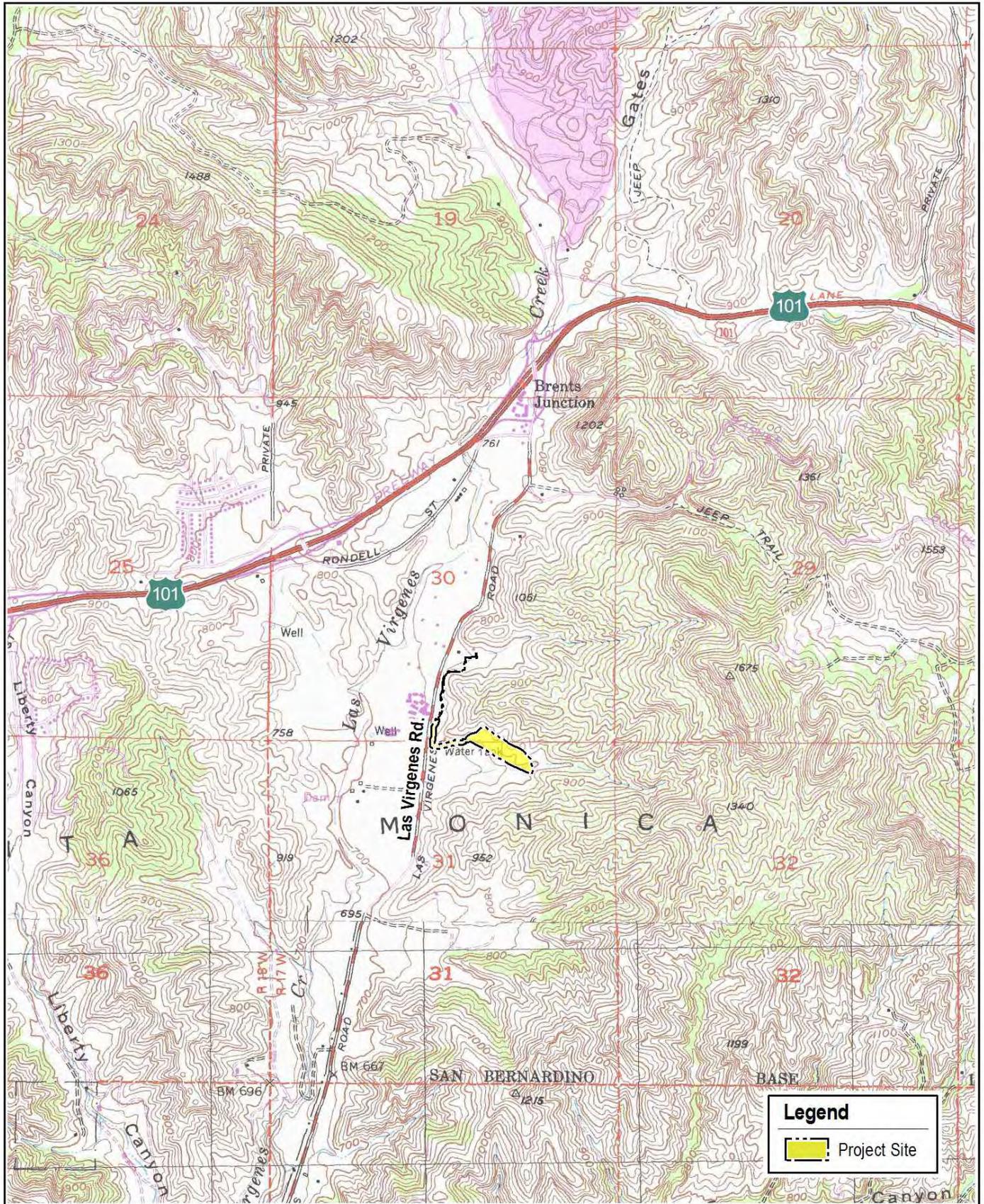
### 2.2 ENVIRONMENTAL SETTING

As shown in **Figure 2.2**, the project site is currently vacant with no existing structures. The majority of the property has been previously cleared and graded to a relatively flat appearance. A man-made linear slope traverses the site in a northwest to southeast direction dividing the property into an upper terrace consisting of artificial fill at the northeast portion, and a lower terrace that comprises the rest of the graded area of the property. The two terraces have an elevation difference of 10 to 20 feet. An existing private dirt road provides access into the property and around the perimeter of the terraces. The remainder of the site is comprised of hillsides and ridgelines that form northern, eastern, and southern boundaries of the site. The site is accessed from either the Bark Park parking lot, or an entrance gate directly from Las Virgenes Road. Both entrances are gated and are not open to the public. The upper terrace was constructed from excavated materials from the construction of the Rancho Las Virgenes Composting Facilities in the early 1990s.

The Calabasas General Plan Land Use Map designates the property as Open Space – Resource Protection, and the adjacent segment of Las Virgenes Road is within the Las Virgenes Scenic Corridor. Surrounding land uses include the adjacent Bark Park neighborhood recreation facility, and open space areas, as well as development on the opposite side of Las Virgenes Road that consists of residences (single-family and multi-family), A. E. Wright Middle

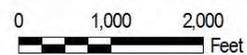
---

<sup>1</sup> The Calabasas Bark Park is located on property owned by the JPA and leased for \$1 per year to the City of Calabasas.



Aerial Source: Portions of Calabasas and Malibu Beach 7.5 min USGS Topographic Quadrangles.

Vicinity Map





Source: GoogleEarth Pro, 2012.

School, a preschool, and Las Virgenes Unified School District offices. Additionally, the City's General Plan shows that the project site is located within a wildlife linkage and corridor, and that a designated significant ridgeline lies along the northern boundary of the site.

The project site is currently used by the JPA to dispose of excess recycled water supplies by spray irrigation application. Irrigation activities are monitored by JPA to avoid surface ponding on the site. Other activities that occur onsite include periodic tilling and mowing for weed and vegetation control, and the associated removal and replacement of surface spray irrigation pipes to facilitate vegetation management.

### **2.3 PROJECT CHARACTERISTICS**

The project proposes to develop a solar generation facility on approximately six acres located in the northeast portion of the North Canyon property of the Rancho Las Virgenes property, consisting of photovoltaic solar panels and associated electrical equipment. The electricity generated at the site would be transmitted via a step-up transformer to the recycled water pump station located at LVMWD headquarters by approximately 2,500 linear feet of cable that would be installed underground. At the termination of the transmission line, a step-down transformer and switchgear would be installed at the recycled water pump station.

The solar panels would be installed in rows along the base of an existing slope on the property that forms a ridgeline at the northern boundary of the property. The panels would be constructed on the upper terrace portion of the site, which is approximately 6 acres. The development footprint where solar panels would be constructed would be roughly rectangular in shape and approximately 860 feet long by 225 feet across.

The solar panel installation would be comprised of 38 rows of panels that tilt to track the sun. Each row would be approximately 10 feet wide when the panels are in a horizontal position, with a 13-foot space between each row. The solar panels would be mounted on poles driven into the ground, and when tilted to their most vertical alignment (approximately 45 degrees) would extend to a maximum height of about 10 feet at the upper edges, with approximately three feet of ground clearance at the lower edges. A two-inch thick layer of gravel will be spread beneath the panels to control weed growth<sup>2</sup>. The associated electrical devices, consisting of two inverters and a step-up transformer would be located amid the solar panel array and mounted on a 28-foot by 11-foot, reinforced concrete pad. The project would also include installation of a step-down transformer located at the LVMWD headquarters site, which would also be mounted on reinforced concrete pad to be placed over an existing paved area adjacent to the recycled water pump facility.

Access to the site for construction and maintenance operations would be through the existing private gates, from Las Virgenes Road and from the Calabasas Bark Park parking lot. The existing dirt road would be retained and maintained to provide a 20-foot wide access road around the perimeter of the site per direction by the Los Angeles County Fire Department. At

---

<sup>2</sup> Personal communication between Kevin Ross, Project Development Manager representing Solar city, and Envicom Corporation, February 12, 2013.

the direction of the Fire Department, the project would maintain a fuel modification zone of vegetation management extending 10 feet beyond the perimeter dirt road.

Once in operation, the site will not be accessed or attended by personnel except for periodic testing or maintenance activities, which would include washing of the panels approximately once annually.

### **Construction**

The project site is relatively level having been previously rough graded and tilled as part of ongoing operations to spray excess recycled water and control vegetation growth onsite. To construct the proposed solar generation facility, minimal finish grading will be done to ensure a maximum two percent slope across the site to facilitate drainage and prevent stormwater from ponding within the project area. Therefore, No the project will not import or export of soils. The mounting poles on which the solar panels would be installed would be driven into the ground to a depth of 6 to 14 feet depending on geological conditions. A two-inch thick layer of gravel would be spread across the site below the solar panels to control weed growth. To achieve a 2-inch thick gravel layer beneath the panels for dust and weed control, approximately 1,613 cy of gravel (for a 6-acre area) will be provided. This would require a total of 134 trucks (12 c.y. per truck) to deliver the gravel material. The delivery schedule for this material has not been established, however a total of 3 to 4 days would be required for the total number of trucks to access the site.

Associated electrical equipment would also be installed at the site, and construction activities would include providing reinforced concrete pads for foundations to install the facilities inverters, transformers, and associated switchgear.

The project construction phase would be expected be completed in 2013 with operations beginning upon construction completion. Construction staging areas for equipment, materials and employee vehicles would be contained entirely onsite. Construction vehicles would access the site via the private gate at the Bark Park, or through a private gate from Las Virgenes Road.

### **Connection to Recycled Water Pump Station**

To transmit electricity generated by the project to the existing recycled water pump station, located at LVMWD headquarters, an underground conduit and cable would be installed within approximately 2,500 linear feet of existing dirt road and paved parking lot/driveway areas. Installation of the conduit would require cutting a trench of approximately 12 inches wide and 3 feet deep following the existing dirt roads on the site, and within a paved access road that includes the Bark Park parking lot, and extending to the LVMWD headquarters where it would terminate at the recycled water pump station. A secondary conduit will be installed within the same trench to provide for potential expansion of the facility. Trenched areas would be backfilled, and asphalt patching would repair cuts in pavement.

## **2.4 DISCRETIONARY ACTIONS**

As the designated Lead Agency, the JPA has assumed responsibility for preparing this document. The decision to approve the project is within the purview of the Joint Powers Authority. The information included in this MND would be used to consider potential impacts to

the physical environment associated with the project when making the decision to approve the project. The Draft MND will be made available for review to the public and public agencies for 30 days to provide comments on the “sufficiency of the document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated” (Section 15204 of the CEQA Guidelines).

The MND will be used by agencies, including the lead agency, in making decisions regarding issuance of discretionary permits as deemed applicable to this project.

## 3.0 FINDINGS

The JPA finds that the proposed project would not have a significant adverse effect on the environment based on the Initial Study/Environmental Checklist (see *Section 4*) and the Environmental Evaluation Discussion (see *Section 5*). Some potentially significant effects have been identified and mitigation measures have been incorporated into the project to ensure that these impacts remain at less than significant levels. A Mitigated Negative Declaration (MND) is therefore proposed to satisfy the requirements of CEQA (PRC 21000 et. seq. 14 Cal. Code Resolution 15000 et. seq.). This conclusion is supported by the findings detailed in *Section 3.1*.

### 3.1 FINDINGS OF NO SIGNIFICANT EFFECT

**1. *Aesthetics:*** Project implementation would not significantly affect scenic vistas, scenic resources, the visual quality of the site or its surroundings, day or nighttime views, and would not result in significant light or glare effects (see Section 5.1, Aesthetics). Due to the site's limited visibility, which is concealed or screened by terrain and landscaping trees, the project would not substantially alter the visual character or quality of views from public viewpoints. However, to further reduce project impacts, Mitigation Measures Aesthetics-1 and -2 have been provided.

**2. *Agricultural Resources:*** Project implementation would not significantly affect agricultural resources (see Section 5.2, Agricultural Resources). Although the Los Angeles County Important Farmland Map prepared by the California Department of Conservation (DOC) shows the project site is designated as Prime Farmland,<sup>3</sup> no agricultural production occurs on this site nor are there adjacent areas to the site that are actively being farmed. The project would not conflict with existing zoning for agricultural use because it is not designated under any Williamson Act contract. Since the site itself is not currently farmed and is used for disposal of excess recycled water regulated by the Regional Water Quality Control Board (RWQCB), and the proposed project would not substantially change the existing environment landforms or soil conditions, the project would not convert farmland to non-agricultural use. Additionally, there are no forest lands on the project site or in the vicinity. Therefore, impacts to agricultural resources would be less than significant.

**3. *Air Quality:*** The proposed project would provide electricity generation from a renewable energy source (solar) to reduce an existing electricity demand for operation of a recycled water pumping station. The operations of the proposed project would not create long-term significant impacts and would not obstruct the implementation of the AQMP. The project's construction phase would not create significant short-term construction related air quality impacts, as enhanced dust control measures are required by SCAQMD Rule 403 due to the non-attainment status of the air basin for PM-10/PM-2.5. Off-site construction-related emissions would not be significant as no soil export operations would be performed. Recommended mitigation measures were identified to further reduce emissions from construction activities. (see Section 3.2, Mitigation Measures and Monitoring Program and Section 5.3, Air Quality).

**4. *Biological Resources:*** No special-status species requiring a mandatory finding of significance under CEQA 15380 have been found or are expected at the site due to the highly

---

<sup>3</sup> California Department of Conservation 2010.

disturbed non-native conditions, including the 20-foot perimeter roadway and 10-foot vegetation clearance buffer required by the Los Angeles County Fire Department. The site does not have any streambed or riparian habitat, wetlands or jurisdictional waters of the U.S., and is not located within a Habitat Conservation Plan area. The project would be located within a habitat linkage and although fauna may avoid the site, which would not be vegetated, the project would not represent a barrier to wildlife movement as no fencing is proposed and wildlife could pass between the solar panels allowing dispersal of fauna. No artificial night lighting is proposed that would dissuade wildlife from moving through the site. The project site does not include any oak trees protected by City ordinance, however there are several protected oak trees within near proximity to the project site boundary, and as such could be subject to root protection zone impacts, or inadvertent direct impacts from onsite construction equipment. Mitigation measures have been incorporated to reduce potential impacts to biological resources (nesting birds and oak trees) to below a level of significance (see Section 3.2, Mitigation Measures and Monitoring Program and Section 5.4, Biological Resources).

**5. Cultural Resources:** Project implementation would not cause a substantial adverse change in the significance of historical or archaeological resources, and would not disturb any human remains, as there are none of the resources known or expected to occur on the site. The entire project footprint would be on previously disturbed soils, including fill that makes up the upper terrace where the project would be constructed, and previously graded roadways and parking lots (paved and unpaved) where the transmission line would be placed underground. As such, it is unlikely that cultural resources would exist in these disturbed areas and no mitigation is required (see Section 5.5, Cultural Resources).

**6. Geology and Soils:** The project would not introduce habitable facilities for residents or employees and as such would not result in a significant onsite risk of injury or loss of life from geological hazards. As the site is currently graded and relatively level, the minimal earth movement proposed would not cause a significant risk for off-site persons or property. Prior to construction of the project, geological evaluations will be performed onsite to determine specifications for installation and ensure stability of the project components onsite. Therefore significant impacts related to geologic hazards are not anticipated (see Section 5.6, Geology and Soils).

**7. Greenhouse Gas Emissions:** The project is being implemented to provide electricity from a renewable resource, which would result in a decrease in greenhouse gas emissions. There would be no conflict with any plan, policy, or regulation that has been adopted to reduce such emissions. Therefore, no significant impacts are anticipated (see Section 5.7, Greenhouse Gas Emissions).

**8. Hazards and Hazardous Materials:** The project site has not been identified as potentially having contaminated soils or other hazardous materials or waste. Additionally, the project will not involve the use of explosives or acutely hazardous materials, and would not generate hazardous emissions during operation. During construction, relatively small amounts of hazardous substances, such as lubricants and solvents to be used onsite, would be transported and handled in accordance with all federal, state and local laws regulating the management and use of hazardous materials. The project site has not been identified on a list of hazardous materials sites, according to data from the DTSC, and is not located within the vicinity of a

private airstrip. Implementation of the project would not significantly impact emergency access during construction or operations and would not interfere with emergency evacuation plans. No significant impacts related to hazards or hazardous materials impacts would result (see Section 5.8, Hazards and Hazardous Materials).

**9. Hydrology and Water Quality:** Construction of the project would not require substantial earth movement as the site is already rough graded, however some minor finish grading would occur that could potentially result in pollutants such as excess sediment being transported by runoff water. Being designed for the application and infiltration of excess recycled water supplies, runoff water would not be likely to leave the site. In the event that sufficient rainfall occurs during construction to result in runoff leaving the site, that water would enter existing storm water conveyance systems, including Las Virgenes/Malibu Creek, which is currently listed on the State Water Resource Control Board's 303(d) list of impaired water bodies for coliform, nutrients, organic enrichment, scum, sedimentation, selenium, and trash (2002, CWA Section 303(d), List of Water Quality Limited Segments, LA RWQCB). Additionally, the construction phase would result in disturbed soils from trenching (12 inches wide and 3 feet deep) along approximately 2,500 linear feet to install underground cable, as well as minor disturbance onsite during installation of the solar panels mounting apparatus, which could create the potential for offsite sediment transport that could be deposited in the aforementioned water bodies. The short-term construction impacts are considered potentially significant, however project construction impacts are determined to be less than significant subsequent to the implementation of Mitigation Measure WQ-1. (see Section 5.9, Hydrology and Water Quality).

With regard to operational impacts, the project would not significantly increase runoff water from the site nor interfere with groundwater recharge, as areas beneath the proposed solar panels would remain pervious and no substantial impervious surfaces are proposed. As such, the project would not contribute significant amounts of runoff water to the existing drainage pattern. The project is not located within 100-year flood plain nor are there levee or dam structures located upstream of the project site. No significant impacts are anticipated from the project's operation.

**10. Land Use and Planning:** The proposed project would not physically divide an established community nor conflict with any applicable plan, policy, or regulation of an agency with jurisdiction over the project site including any applicable habitat conservation plan or natural community conservation plan. No significant impacts are anticipated (see Section 5.10, Land Use and Planning).

**11. Mineral Resources:** Project implementation would not result in the loss of availability of a known mineral resource or the loss of availability of a locally important and delineated mineral resource recovery site (see Section 5.11, Mineral Resources).

**12. Noise:** Project construction activities would generate noise that could potentially exceed standard noise ordinance thresholds at nearby residences. The City of Calabasas noise ordinance provides an exception to the noise limitations for construction activities that occur during prescribed daytime hours. Mitigation measures have been identified that would reduce potential construction noise impacts to less than significant. The project would not expose sensitive receptors to significant ground vibrations during construction, and would not generate

traffic noise levels that would contribute to a significant noise increase under existing or cumulative conditions. The project would not be located near a public or private airport (see Section 3.2, Mitigation Measures and Monitoring Program and Section 5.12, Noise).

**13. Population and Housing:** The project would not affect local housing availability, displace substantial numbers of people or impact population trends (see Section 5.13, Population and Housing).

**14. Public Services:** The proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered government facilities (see Section 5.14, Public Services).

**15. Recreation:** The project would not significantly affect recreational facilities in the project vicinity nor does the project include or require the construction of recreational facilities (see Section 5.15, Recreation).

**16. Transportation/Traffic:** The project would not have a significant impact on transportation/traffic, including direct and cumulative effects and parking impacts, during operation or construction (see Section 5.16, Transportation/Traffic) or conflict with applicable policies, plans, programs or congestion management programs. However, implementation of Mitigation Measures Traffic-1 and Traffic-2 would ensure that appropriate traffic controls and scheduling are implemented during project construction, and that use of local roads by vehicles related to project construction is minimized. The project would not have any direct impacts on air traffic, as the site is not located in proximity to a regional or private airport, and does not include development of a private airstrip or heliport. The project would not alter roadway design, or introduce a land use that would be incompatible with existing traffic patterns. Impacts related to emergency access would be less than significant, as private entryways would be available for such access, and an existing dirt roadway network onsite will provide internal circulation.

**17. Utilities and Service Systems:** Project implementation would not significantly affect utilities and service systems, including water supply, wastewater treatment, and solid waste disposal. Operation of the project would not generate solid waste, or wastewater, and water use would consist of washing the solar panels approximately once annually. The project would facilitate water conservation actions by providing a less expensive energy supply to power the JPA recycled water system (see Section 5.17, Utilities and Service Systems). The project does not propose to provide facilities that would generate wastewater or facilities that would provide such treatment, nor does the project require any new drainage facilities or be expected to result in a substantial increase of runoff water. Operational solid waste would not be generated, in that no personnel would be employed onsite with the exception of periodic maintenance activities. Solid waste generated during project construction would not result in significant impacts to the Calabasas Landfill, which has adequate capacity to remain operational for the next ten years. The project would separate recyclable construction materials onsite for diversion from landfill disposal to facilitate the City's compliance with AB 939 requirements. Any hazardous materials to be used on the site would be recycled, treated, and disposed of in accordance with federal, state, and local laws, and therefore no impact would result under this criterion.

### 3.2 MITIGATION MEASURES AND MONITORING PROGRAM

The section provides a summary of the various mitigation measures to be imposed on the project to reduce impacts to less than significant. These mitigation measures include:

#### Aesthetics

~~Aes-1. The applicant shall plant additional trees at the time of project construction where gaps in the existing treeline along Las Virgenes Road provide unscreened views of the project site. Mitigation trees shall be placed so that visual screening of the site will be enhanced as the trees mature. Such planting shall not obstruct the existing gate and roadway that provides access to the site. The trees planted for this mitigation shall consist of a combined mix of evergreen and deciduous varieties, and the number, size, and placement of mitigation trees for visual screening shall be determined in consultation with the City of Calabasas Director of Community Services.~~

~~Aes-2. The applicant shall consult with the City of Calabasas Director of Community Services regarding the site's design in relationship to the Las Virgenes Scenic Corridor Design Guidelines.~~

Aes-1. The applicant shall plant additional trees at the time of project construction on the slope between the upper terrace and lower terrace areas of the property to provide visual screening of the solar panels while preserving the existing ridgeline view from Las Virgenes Road. The trees planted for this mitigation shall consist of a combined mix of evergreen and deciduous varieties, and the number, size, and placement of mitigation trees for visual screening shall be determined in consultation with the City of Calabasas Director of Community Services.

Aes-2. The applicant shall coordinate with the City of Calabasas staff to design and implement a landscape plan that would reduce visual impacts to the Scenic Corridor.

#### Air Quality

AQ-1. The applicant shall:

- Appoint a construction relations officer to act as a community liaison concerning on-site construction activity including resolution of issues related to PM-10 generation,
- Ensure that all vehicles and equipment will be properly tuned and maintained according to manufacturers specifications,
- Use materials that do not require painting when feasible,
- Use pre-painted construction materials,
- Give preference to contractors who use 2010 and newer diesel haul trucks (e.g. material delivery trucks),

- During project construction all internal combustion engines/construction equipment operating on the project site shall meet EPA-Certified Tier 2 emissions standards, or higher.
- Establish a preference for contractors using diesel particulate filters (DPF) as applicable.

### **Biological Resources**

*Bio-1.* No earlier than 14 days prior to grading, site preparation, or construction activities that would occur during the nesting/breeding season of native bird species potentially nesting on the site (typically February 1 through August 31), a qualified biologist shall perform two field surveys to determine if active nests of any bird species protected by the state or federal Endangered Species Acts, Migratory Bird Treaty Act, and/or the California Fish and Game Code Sections 3503, 3503.5, or 3511 are present in the project limits or within 500 feet of the project limits. The second nesting bird survey shall be conducted within three days of the start of grading, site preparation, or construction activities. In the event that an active nest(s) is (are) found within the survey area, grading, site preparation, or construction activities within the 500-foot radius shall stop until consultation with the District, CDFW, and USFWS (when applicable, i.e. if the nesting birds are listed under the federal Endangered Species Act), is conducted and an appropriate setback can be established. The buffer shall be demarcated and project activities within the buffer shall be postponed or halted, at the discretion of a biological monitor, until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting.

*Bio-2.* Final site plan drawings shall be provided that clearly demonstrate that all ground disturbance activities would not encroach into any oak tree protection zone as defined by City ordinance. City ordinance defines the protection zone as 5 feet from the canopy dripline, and no less than 15 feet from the tree trunk.

### **Hydrology and Water Quality**

*WQ-1.* During construction activities, disturbed soils from trenching operations shall be used to backfill the trench to existing ground elevations following installation of the cables and/or conduit as proposed. Where trenching requires pavement cutting, the trenches shall be backfilled and the pavement will be patched. Pavement cuttings shall be recycled if feasible, or disposed of off-site pursuant to applicable regulations for such material.<sup>4</sup> The project applicant shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the State Water Resources Control Board Waste Discharge Requirements for Discharges for Storm Water Runoff Associated With Construction and Land

---

<sup>4</sup> Asphalt waste is accepted at the Calabasas Landfill operated by the County of Los Angeles approximately 2.5 miles from the project site.

Disturbance Activities.<sup>5</sup> The SWPPP shall be subject to review and approval by the Regional Water Quality Control Board. The applicant shall monitor adherence to the requirements contained in the SWPPP and as stipulated in the General Permit, including specific monitoring, sampling, and testing procedures for stormwater leaving the site as applicable.

### **Noise**

- Noise-1.* The construction contractor shall oversee that construction activities only occur from 7:00 a.m. to 6:00 p.m., Monday through Friday, and Saturday from 8:00 a.m. to 5:00 p.m. Construction shall not be permitted on Sunday or holidays without prior consultation with the City of Calabasas Community Development Director.
- Noise-2.* The construction contractor shall oversee that all mobile equipment have properly operating and maintained mufflers.
- Noise-3.* The construction contractor shall designate onsite areas for construction worker vehicles and for storage of equipment and materials. These areas shall be set back from the roadway and neighboring residences approximately 600 feet or otherwise shielded from the surrounding developments.

### **Traffic**

- Traffic-1.* Throughout the duration of construction activities, construction traffic shall not block emergency vehicle access along Las Virgenes Road or other area roadways. Delivery routes shall be designed to minimize use of City streets, and if feasible, scheduled to avoid peak traffic hours. The applicant shall consult with the City of Calabasas Department of Public Works Transportation/Transit Division prior to initiation of construction activities that may affect area traffic (such as delivery of equipment or materials necessitating lane closures) and will implement appropriate traffic controls in accordance with the California Vehicle Code and other state and local requirements to avoid or minimize impacts on traffic.
- Traffic-2.* Throughout the duration of construction activities, construction traffic for delivery of materials or equipment shall be prohibited along Las Virgenes Road during the hours of 7:30 am – 9:30 am and 2:30 pm – 3:30 pm while A.E. Wright Middle School is in session. This prohibition shall not be in effect during summer months when the school is not in session (June 12, 2013 through August 21, 2013).

---

<sup>5</sup> State Water Resources Control Board, Order No. 2009-0009-DWQ 9 as amended by Order No. 2010-0014-DWQ) National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, September 2, 2009 (modified November 16, 2010).

This page intentionally left blank

## 4.0 INITIAL STUDY

### CALIFORNIA ENVIRONMENTAL QUALITY ACT INITIAL STUDY AND CHECKLIST

1. **Project title:**  
Joint Powers Authority 1MW Solar Generation Project
2. **Lead agency name and address:**  
Joint Powers Authority (JPA)  
4232 Las Virgenes Road  
Calabasas, California 91302
3. **Contact person and phone number:**  
Mr. John Zhao, P.E.  
Phone (818) 251-2100
4. **Project location:**  
Within the 3900 and 4000 blocks of Las Virgenes Road Calabasas, CA 91302

The Project is located in western Los Angeles County within the City of Calabasas and occupies a portion of Sections 30 and 31, Township 1 North, Range 17 West as shown on the USGS 7.5' Calabasas Quadrangle. The project site is situated on the east side of Las Virgenes Road between the intersections of Meadow Creek Lane and A. E. Wright Middle School, and includes a 6-acre portion of APN numbers 2069-011-904 and 4455-025-900. A proposed underground electrical transmission line would traverse portions of properties identified as APN numbers 2069-011-901, -902, -905, -906, and -907 to connect the project site with the recycled water pump station. All affected parcels are owned by JPA.

5. **Project sponsor's name and address:**  
Joint Powers Authority  
4232 Las Virgenes Road  
Calabasas, California 91302
6. **General plan designation:**  
Open Space – Resource Protection (City of Calabasas  
2030 General Plan, 2008)
7. **Zoning:**  
OS

8. **Description of project:**  
The proposed project would construct and operate a 1MW solar generation facility to be located in western Los Angeles County, within the City of Calabasas, California. The purpose of the project would be to provide a renewable source of energy to power an existing Recycled Water Pump Station. The project components would consist of an approximately 6-acre photovoltaic array, approximately 2,500 feet of underground electrical transmission line and conduit, and other associated electrical equipment including two capacity inverters, and step-up and step-down transformers.

The site would be accessed by private entry driveways from Las Virgenes Road and from the Calabasas Bark Park parking lot. No public access would be provided. The project would not introduce habitable structures and once operational would not have onsite personnel with the exception of periodic maintenance activities (see attached project description in Section 2 for additional information).

**9. Surrounding land uses and setting:**

Adjacent land uses include public and private open space, a composting facility (operated by LVMWD), and a neighborhood park (Calabasas Bark Park). Land uses that are located on the opposite side of Ls Virgenes Road include A.E. Wright Middle School, a single-family residential neighborhood, and a multi-family residential development.

**10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):**

None.

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> Aesthetics             | <input type="checkbox"/> Agriculture Resources         | <input checked="" type="checkbox"/> Air Quality                        |
| <input checked="" type="checkbox"/> Biological Resources   | <input type="checkbox"/> Cultural Resources            | <input type="checkbox"/> Geology /Soils                                |
| <input type="checkbox"/> Greenhouse Gas Emissions          | <input type="checkbox"/> Hazards & Hazardous Materials | <input checked="" type="checkbox"/> Hydrology/Water Quality            |
| <input type="checkbox"/> Land Use/Planning                 | <input type="checkbox"/> Mineral Resources             | <input checked="" type="checkbox"/> Noise                              |
| <input type="checkbox"/> Population/Housing                | <input type="checkbox"/> Public Services               | <input type="checkbox"/> Recreation                                    |
| <input checked="" type="checkbox"/> Transportation/Traffic | <input type="checkbox"/> Utilities/Service Systems     | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

**DETERMINATION:**

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on

attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project. Therefore, an EIR Addendum will be prepared.

  
\_\_\_\_\_  
Signature

3/27/13  
\_\_\_\_\_  
Date

---

**EVALUATION OF ENVIRONMENTAL IMPACTS:**

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
  - a) Earlier Analysis Used. Identify and state where they are available for review.
  - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9. The explanation of each issue should identify:

- a) the significance criteria or threshold, if any, used to evaluate each question; and
- b) the mitigation measure identified, if any, to reduce the impact to less than significance.

---



---

**ENVIRONMENTAL IMPACTS**

(Explanations of all potentially and less than significant impacts are included in Section 5 *Discussion of Initial Study Environmental Checklist*)

---



---

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>I. AESTHETICS.</b> Would the project:				
a. Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>II. AGRICULTURAL RESOURCES.</b> Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Conflict the existing zoning for agricultural use, or a Williamson Act Contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>III. AIR QUALITY.</b> The significance criteria				

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
established by the South Coast Air Quality Management District (SCAQMD) may be relied upon to make the following determinations. Would the project result in:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>IV. BIOLOGICAL RESOURCES.</b> Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in the City or regional plans, policies, regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh vernal pool, coastal, etc.) Through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
preservation policy or ordinance?				
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>V. CULTURAL RESOURCES:</b> Would the project:				
a. Cause a substantial adverse change in significance of a historical resource as defined in CEQA Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Cause a substantial adverse change in significance of an archaeological resource pursuant to CEQA Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>VI. GEOLOGY AND SOILS.</b> Would the project:				
a. Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii. Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii. Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv. Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>VII. GREENHOUSE GAS EMISSIONS.</b> Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>VIII. HAZARDS AND HAZARDOUS MATERIALS.</b> Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
people residing or working in the project area?				
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for the people residing or working in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>IX. HYDROLOGY AND WATER QUALITY.</b> Would the proposal result in:				
a. Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned land uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Place housing within a 100-year flood plain as mapped on federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
delineation map?				
h. Place within a 100-year flood plain structures, which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j. Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>X. LAND USE AND PLANNING.</b> Would the project:				
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XI. MINERAL RESOURCES.</b> Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XII. NOISE.</b> Would the project result in:				
a. Exposure of persons to or generation of noise in level in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Exposure of people to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XIII. POPULATION AND HOUSING.</b> Would the project:				
a. Induce substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XIV. PUBLIC SERVICES.</b> Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a. Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XV. RECREATION.</b>				
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XVI. TRANSPORTATION/TRAFFIC.</b> Would the project:				
a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XVII. UTILITIES AND SERVICE SYSTEMS.</b> Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Have sufficient water supplies available to serve the project from existing entitlements and resource, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.**

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Does the project have impacts which are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Does the project have environmental effects which cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## 5.0 DISCUSSION OF INITIAL STUDY ENVIRONMENTAL CHECKLIST

The following discussion of environmental impacts anticipated to occur with implementation of the proposed project consists of a brief explanation for each of the answers provided in the Initial Study/Environmental Checklist. For each issue addressed below, the impacts associated with development of this project have been determined to be “Less Than Significant with Mitigation Incorporated”, “Less Than Significant”, or “No Impact”. Data and information has been provided to substantiate the level of significance determination for each impact issue. The issues that were determined to be “Less Than Significant with Mitigation Incorporated” will have mitigation measures identified that would reduce impacts to below a level of significance. These mitigation measures will be incorporated into the Mitigation Monitoring and Reporting Program (MMRP) to be developed for the project.

### 5.1. AESTHETICS

#### a) Would the project have a substantial adverse effect on a scenic vista?

***Less Than Significant Impact With Mitigation.*** The project would be constructed at the margins of urban development within the City of Calabasas where land uses transition from urban uses to open space. This discussion evaluates the project’s potential impacts on scenic views from Las Virgenes Road, as well as from public recreation areas that are located nearby. Additionally, this evaluation addresses potential aesthetic impacts on scenic views from existing public trails. The following evaluation relies primarily on City of Calabasas policies and regulations regarding visual resources, and a site reconnaissance performed by Envicom Corporation to determine relevant public viewpoints. Representative photographs were taken to document the existing conditions. A map of locations of the photographs discussed below is shown in Figure 5.1-1.

#### Scenic Views from Las Virgenes Road

The project site is located within the Las Virgenes Scenic Corridor as designated by the City of Calabasas General Plan. The City of Calabasas defines the corridor as “a key cross-mountain roadway that provides primary access to the Malibu Creek State Park area and the Pacific Coast”<sup>6</sup>. The City has defined a Scenic Corridor (-SC) Overlay Zone (Calabasas Municipal Code Section 17.18.040) for properties adjacent to scenic corridor roadways, including the Las Virgenes Scenic Corridor.

The purpose of the –SC overlay zoning district is to: protect an important economic and cultural base of the City by preventing the destruction of the natural beauty and environment of the City; to safeguard and enhance property values; to protect public and private investment, buildings and open spaces; and to protect and enhance the public health, safety, and welfare.

The -SC overlay zoning district boundaries include all properties that are:

<sup>6</sup> City of Calabasas General Plan 2030 2008 pg. IX-28.

- Located within five hundred (500) feet of a road designated as a scenic corridor;
- Located between a designated scenic corridor road and the prominent ridgeline which defines the viewshed from the scenic corridor; or
- Where the director determines development may have an impact upon the designated scenic corridor.

The project site is located approximately 600 feet east of Las Virgenes Road, which is beyond the 500-foot limit for the –SC Overlay, however the site is located between the roadway and a prominent ridgeline. Therefore, an evaluation was conducted of the visibility of resources and the location of the project itself as seen from Las Virgenes Road, and whether the project would represent a significant impact to scenic views of the hill and mountain areas which the traveling public may enjoy from the scenic corridor.

The project site is situated within a canyon area with steep hillsides and ridgelines that restrict the viewshed of this site. The east-west trending ridgelines that define the northern and southern boundary of the project site viewshed conceal the project site from views along the majority of the designated scenic corridor, with the exception of a 0.12-mile segment (approximately 650 feet) between Meadow Creek Lane and A.E. Wright Middle School. The lower elevations of the canyon are relatively level from previous grading and periodic tilling of soils for vegetation control. The project would be constructed along the base of the northern ridgeline, so that southerly views of the site would not be available from Las Virgenes Road. This restricts the portion of the view corridor that could potentially provide views of the site to northerly views.

The project site is setback from the roadway a distance of approximately 600-1,600 feet, located at the base of the northern ridgeline. The northerly view of the site available from Las Virgenes Road is significantly screened by an existing row of trees, consisting of a mix of deciduous and evergreen varieties, as seen in the existing conditions photo provided in Figure 5.1-2. In addition to the nearly continuous row of roadside trees, the foreground view includes utility poles and associated overhead transmission lines. From sporadic viewing locations along this roadway, available through gaps in the existing roadside trees and where a private gate and access road enters the subject property, the site has the appearance of an agricultural field, with undeveloped hillsides and ridgelines seen in the background. It is noted that the deciduous varieties of the existing roadside trees provide less visual screening during winter months, however the mix of deciduous and evergreen trees as provided on the site is consistent with stated guidelines regarding landscaping for the City's scenic corridors.

The project would be constructed atop an upper terrace consisting of approximately 6 acres of previously graded and tilled land. This upper terrace lies at an elevation that is approximately 10 to 20 feet higher than the adjacent lower terrace. The lower terrace area comprises the majority of the subject property, and is situated at a similar elevation as Las Virgenes Road. As such, visibility of the upper terrace area is limited to the southwestern edge, consequently most of the panels would not be seen from Las Virgenes Road. The proposed solar panels would be mounted approximately 3 feet above ground on poles driven into the ground, and when rotated to the most upright position would reach a maximum height of about 10 feet above ground. The ridgeline that frames the project would be approximately 150 to 300 feet higher than the

proposed solar panels; therefore the project would not block views of significant ridgelines designated in the City's general plan as scenic resources on the site and beyond.

The project design would place the proposed solar panels at a substantial setback from the roadway, and at elevations that are considerably lower than the ridgelines of the site. Therefore, the portion of the site that lies nearest the roadway, and the site's higher ridgeline areas that contain the most visible scenic resources, would not be altered from existing conditions. Due to the region's topography which limits the potential for public views of the project site from the roadway, high ridgelines that dominate the viewshed, a substantial project setback from the roadway, and significant visual screening by existing trees, the project would have a less than significant impact regarding a scenic vista. However, to further reduce impacts, mitigation measures Aes-1 and -2 have been provided.

### **Mitigation Measures**

#### **Aes-1:**

The applicant shall plant additional trees at the time of project construction on the slope between the upper terrace and lower terrace areas of the property to provide visual screening of the solar panels while preserving the existing ridgeline view from Las Virgenes Road. The trees planted for this mitigation shall consist of a combined mix of evergreen and deciduous varieties, and the number, size, and placement of mitigation trees for visual screening shall be determined in consultation with the City of Calabasas Director of Community Services.

~~The applicant shall plant additional trees at the time of project construction where gaps in the existing treeline along Las Virgenes Road provide unscreened views of the project site. Mitigation trees shall be placed so that visual screening of the site will be enhanced as the trees mature. Such planting shall not obstruct the existing gate and roadway that provides access to the site. The trees planted for this mitigation shall consist of a combined mix of evergreen and deciduous varieties, and the number, size, and placement of mitigation trees for visual screening shall be determined in consultation with the City of Calabasas Director of Community Services.~~

#### **Aes-2:**

The applicant shall coordinate with the City of Calabasas staff to design and implement a landscape plan that would reduce visual impacts to the Scenic Corridor.

~~The applicant shall consult with the City of Calabasas Director of Community Services regarding the site's design in relationship to the Las Virgenes Scenic Corridor Design Guidelines.~~

### **Scenic Views from Public Recreation Areas**

The project site is located near public park areas including the Calabasas Bark Park and Juan Bautista de Anza Park administered by the City of Calabasas, and Malibu Creek State Park. Additionally, public trail systems cross open space areas in the project site vicinity. This analysis provides an evaluation of the project's potential to impact views from these locations.

#### *Public Parks*

The Calabasas Bark Park is located adjacent to the northern boundary of the project site. A significant ridgeline exists between the properties, which visually separates the project site from the Bark Park. As such, the project would not impact views from this park.

Juan Bautista de Anza Park is located at the intersection of Las Virgenes Road and Lost Hills Road approximately 0.5 mile from the project site. Northeast views from this park (towards the project site) are characterized by existing multi-family developments and intervening ridgelines that prevent views of the project site from this location.

Malibu Creek State Park is a 7,000-acre recreational area for hiking biking and equestrian use. The park entrance is approximately 2.5 miles south of the project site on Las Virgenes Road. The park boundary extends north towards the project site along the west side of Las Virgenes Road. Intervening ridgelines prevent views of the project site from this location. Some portions of the park are located along the crest of the Santa Monica Mountains and as such have extended views of the region including various cities along the U.S. 101 corridor. It is possible that the site would be within views from some elevated portions of Malibu Creek State Park, however due to distances of over four miles, and elevation differences of about 1,000 feet, the project site would blend with other urban aspects of landscape of the western Calabasas if visible in views from the higher elevations of the State Park.

As the project site cannot be viewed from public parks within the City of Calabasas, and if visible from distant portions of Malibu Creek State Park, would not alter the visual character of such views, the project would have no impacts on views from those facilities.

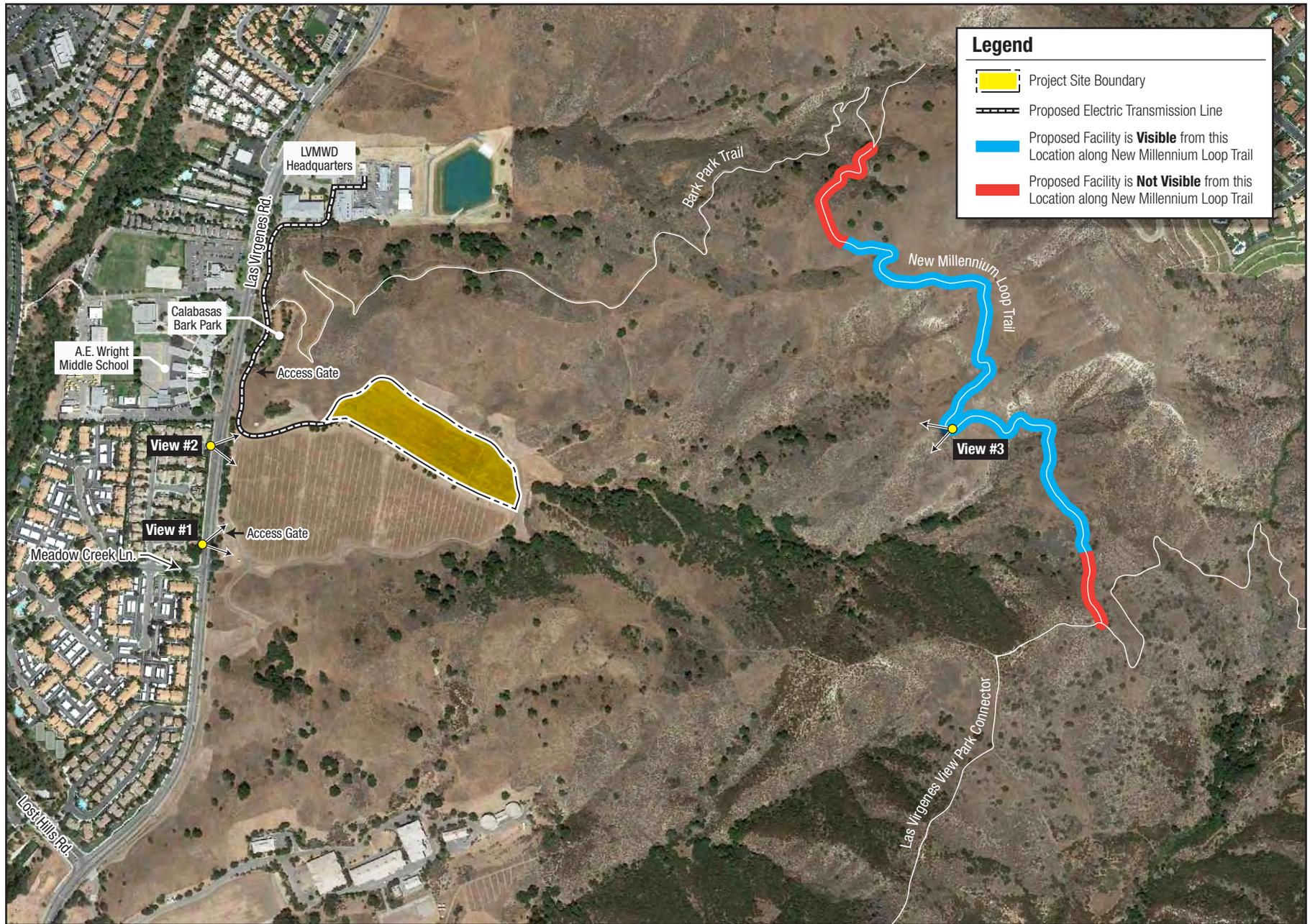
#### *Public Trails*

Public trails in the vicinity of the project site provide recreation opportunities for hiking, biking, and equestrian use. These trails include the New Millennium Loop Trail, the Bark Park Trail, a network of additional trails to the north and east of the project site, and the Grasslands Trail, which provides access into Malibu Creek State Park from Juan Bautista de Anza Park. To evaluate visual impacts from these locations, photographs were taken from key locations along each of these trails that represented potential viewpoints of the project site.

The Grasslands Trail is accessed from Juan Bautista de Anza Park, which as discussed above, does not provide views of the project site. From that location, the trail extends southerly, parallel to Las Virgenes Road. This trail crests a small ridge approximately 0.7 mile from the park, or about 1.3 miles from the project site. Northeasterly views from this location (towards the project site) include ridgelines that are generally east-west trending, which conceal the project site from being viewed. As this point is representative of the higher elevations attained on this trail north of Mulholland Highway, views from this location would be similar to other views along this trail in regards to visibility of the proposed project.

The Bark Park Trail is located north of the project site and is accessed from Las Virgenes road via the Bark Park parking lot. This trail is at one point approximately 300 feet from the project site, however an intervening ridgeline prevents views of the proposed project site from the Bark Park Trail.

The New Millennium Loop Trail is located within open space and residential developments to the east of the project site. Accessed via the Bark Park Trail, a network of trails traverses these areas, although due to distance and rugged terrain, only the New Millennium Loop Trail would potentially provide views of the project site. At a location east of the project site, approximately 1.3 miles from Las Virgenes Road and an elevation of 1,200 feet (400 feet higher than the project site), trail users would be able to view the site from the New Millennium Loop Trail at a distance of approximately 0.4 mile. As the trail continues to the south, the project site remains generally in view for a distance of approximately 0.6 mile as shown on **Figure 5.1-1**. This distance represents seven percent of the overall New Millennium Loop Trail, and a smaller



Source: GoogleEarth Pro, 2012.

proportion of the overall trail network within this region. Along this trail segment, the project site lies at distances of between 0.4 and 0.6 miles, and with an elevation difference of 400 to 500 feet below the trail. Views from this trail segment include open space areas, and the urban development area of western Calabasas. The project site is seen in the transitional area between urban development and the undeveloped ridgelines, and has the appearance of an agricultural field due to vegetation clearance and periodic soil tilling that occurs on the site (**Figure 5.1-2**). From this distance and elevation, the project would not block views of significant ridgelines or other scenic resources. The project would not significantly change the character of views from this location, which includes views of residences, commercial buildings, and the U.S. 101 Freeway. Therefore, due to the small proportion of the public trail system from which the project site can be viewed, the distance and elevation difference of those views, and the existing urban/commercial features within the viewshed, the proposed solar panels would not have a substantial adverse effect on scenic views from public trails. Impacts related to views from public recreation areas would be less than significant.

#### Other Views

The project site is located within a viewshed characterized by a transition from urban development to open space. Project views from private locations are typically not analyzed in CEQA documents, however in response to stated concerns from the public, the following discussion presents an overview of the project site's visibility and potential to substantially alter an existing private vista.

As discussed previously, the site topography would restrict views of the project from residences, with the exception of those areas located in a west-southwest direction. This orientation conceals the project from the majority of residences in western Calabasas. There are some existing residential developments that have been identified as having eastern views toward the project site and are also located at elevations that afford partial views of the project site.

Private single-family home residential developments with partial views of the project site include those located along:

- Lost Springs Drive and other associated roadways, which are located a distance of 2,000 to 3,000 feet from the project site;
- Mountain Shadows Road and other associated roadways, which are located approximately 3,000 to 4,000 feet from the project site; and
- Marks Road from which as many as ten residences may have partial views of the site from distances of 5,000 to 6,000 feet.

Views from any of these locations would be characterized as having urban and rural elements. Private views from these residences toward the project site would include the high ridgeline areas of central Calabasas, existing residential and commercial developments, with the project site appearing on the eastern edge of this urbanized portion of Calabasas as the level of development transitions to a rural and open space appearance. Implementation of the project would not block views of the designated significant ridgelines visible from private residences, which represent the scenic resources with the highest value and highest visibility as seen from western Calabasas.



**View 1**

Northeasterly view of the project site from Las Virgenes Road, at the southern access gate location. The site is visible at a distance of 900 to 1,100 feet along the base of the ridgeline as seen through gaps in roadside trees. Photo taken February 2, 2013.



**View 2**

Northeasterly view of the project site at a distance of 650 to 1,600 feet showing existing screening by roadside trees. The deciduous trees in the foreground would provide more substantial screening in spring, summer, and fall months. Photo taken February 2, 2013.



**View 3**

Westerly view of the project site as seen from the New Millennium Loop Trail, showing residences and commercial development of western Calabasas. Photo taken February 2, 2013.

**b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?**

**Less Than Significant Impact.** Construction of the solar electricity generation facility on the project site would not damage scenic resources such as trees, rock outcroppings or historic buildings visible from an officially designated State Scenic Highway. As shown on the Department of Transportation's Scenic Highway Mapping System<sup>7</sup>, the portion of Las Virgenes Road that lies adjacent to the subject property is not designated as a scenic highway, and views to the east of this roadway as vehicles or pedestrians travel south from the US 101 Freeway or north from the Las Virgenes Road/Lost Hills Road intersection are constrained by variations in land topography. The proposed project would not affect views of the existing natural environment from a portion of Las Virgenes Road that is designated as an Eligible State Scenic Highway (State Highway 27), which lies south of the Lost Hills Road intersection. This Eligible State Scenic Highway is approximately 0.5 mile south of the project site and is visually separated by an intervening ridgeline. The project would be constructed at a setback distance of 650 feet, on approximately 6 acres; leaving a majority of the JPA property unaltered from existing conditions. Additionally, the ridgeline areas that define the site's viewshed to the north, east, and south would not be disturbed by the proposed development. Construction of the project could potentially impact protected oak trees as defined by City of Calabasas Ordinance, which would be mitigated as discussed in Section 5.4 Biological Resources. Therefore, impacts to scenic resources would be less than significant.

It is noted that the segment of Las Virgenes Road that lies adjacent to the project site is designated as a City Scenic Corridor, and as the project would be located between the roadway and a significant ridgeline, impacts to scenic vistas were evaluated in light of the policies and requirements of the Las Virgenes Corridor Design Plan (LVCDP) as described in Section 5.1-a.

**c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?**

**Less Than Significant Impact.** Refer to response 5.1-a. The project would be located at a site with limited visibility from public roadways due to topography and vegetative screening. The project would leave the majority of the site undisturbed from existing conditions, including areas nearest Las Virgenes Road, and undeveloped ridgelines that offer the most visible and highest value scenic resources of the site.

Mitigation measure Aes-1 has been included to increase visual screening of the site by placing additional trees along Las Virgenes Road. Overall, impacts to the visual character of the vicinity would be less than significant.

---

<sup>7</sup> <http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm> accessed February 2, 2013.

**d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?**

***Less Than Significant Impact.*** The project site is currently open space with no structures onsite, and no associated lighting or reflective surfaces to produce glare.

Lighting

The proposed solar generation facility would not be occupied by personnel, would not include any habitable structure, and would not require any artificial lighting to operate. As such, the project would be consistent with the City's policies and ordinance related to lighting. Construction activities would generally be limited to the hours of 7:00 A.M. to 6:00 P.M. due to noise ordinance restrictions, and as such, would not be expected to occur during evening hours requiring lighting. Any lighting of the construction site for work activities or security would be temporary and would not be considered a substantial source of light. Therefore, the project would have no impact regarding lighting.

Glare

Glare is defined as a harsh uncomfortably bright light, and can be either direct from a light source, or indirect from reflected light. The reflection of light from smooth surfaces such as window glass may be perceived as glare. Buildings constructed of highly reflective materials from which the sun reflects at a low angle commonly cause adverse glare.

To produce electricity from sunlight effectively, solar panels are designed to absorb light and minimize reflection, and therefore the solar panels proposed for this project would be constructed of non-glare material that would minimize reflected light and associated glare impacts. ~~Due to the project being constructed of non-glare materials, and with roadside trees that visually screen the project site from Las Virgenes Road as well as residences to the west, glare impacts would be less than significant.~~

The City's Municipal Code Section 17.20.190 provides requirements for solar panel installations related to glare impacts specifically focused on active or passive heating or cooling features. Although the proposed project does not fit the category regulated by that section of the Code, the project would comply with this ordinance to the extent that the requirements could be applied to the type of facility proposed. This Ordinance includes Section 17.20.190.A which requires that for solar systems regulated by the Code, "ground-mounted collectors shall be screened from a public right-of-way", and 17.20.190.D which states that "exterior surfaces of the collectors and related equipment shall have a non-reflective finish and shall be color-coordinated to harmonize with roof materials and other dominate colors of the structure."

As discussed above in Section 5.1 a), the project site is situated within a canyon area with ridgelines that provide substantial screening of the site from the north, east, and west. Views from the southwest are screened by roadside trees and mitigation measure Aes-1 and Aes-2 provide for additional landscaping on the site to further screen views, as required for solar systems regulated by part A of this ordinance.

In accordance with part D of this ordinance the solar panels to be installed are to be manufactured with a non-reflective coating. As a stand-alone solar generation facility, the

project does not include roof materials to color-coordinate with. Therefore, with landscaping provided and solar panels that incorporate a non-reflective coating, the project would comply with Municipal Code Section 17.20.190.

#### *Solar Panel Reflectivity*

One method to determine an object's reflectivity is to measure the albedo, which is the ratio of solar radiation across the visible and invisible light spectrum reflected by a surface. Albedo varies between 0, a surface that reflects no light, and 1, a mirror-like surface that reflects all incoming light. To provide a comparison of the reflectivity of solar panels to the surrounding environment, solar panels with a single anti-reflective coating have a reflectivity of between .03 and .18 as a measured albedo. By comparison, sand has an albedo rating of between .15 and .45 and agricultural vegetation has an albedo of between .18 and .25. This indicates that the solar panels would not exceed the reflectivity of the area's prevailing grasses and vegetative ground cover.<sup>8</sup>

#### *Reflection Analysis*

The project proposes to install solar panels that tilt with the changing angle of the sun to maintain a perpendicular alignment with incoming solar rays. As the angle of reflection equals the angle of incidence (the incoming angle of light rays), direct reflections from the panels would be directed upwards, back at the sun, thereby eliminating direct reflection impacts at residences and roadways from the solar panels.

As with the potential for direct reflections, indirect reflections would not produce a significant glare effect. Indirect reflections are diffused and by definition significantly less intense than a direct reflection, with a nearly 80 percent reduction in intensity by moving 30 degrees off of the direct reflection angle.<sup>9</sup>

By tracking the sun, the solar panels would be tilted in an east-southeasterly direction facing away from Las Virgenes Road and residences for a substantial portion of the day. As the panels tilt with the changing angle of the sunlight in the afternoon, the panels would be angled in a west-northwesterly facing direction. While tilted to the west, an existing ridgeline that rises to a height of between 30 to 100 feet above the project site's upper terrace would screen the majority of Las Virgenes Road and residences from reflections and associated adverse impacts, should such reflective glare emanate from the solar panels.

As seen in Appendix E, the height of the proposed solar panels would be approximately 70 feet higher than the upper floors of single-family homes located on the west side of Las Virgenes Road to the south and west of the project site. This height variation, along with the alignment of the rows of panels in a northeasterly to southwesterly alignment would minimize indirect reflections from the solar panels from potentially impinging on those residences along Las Virgenes Road, or affecting drivers on the roadway.

This indicates that while at certain times of the day an observer may have a view of an indirect reflection, the relative intensity of the reflection would not cause an adverse glare or be a

---

<sup>8</sup> ESA, Solar Glare Analysis of Proposed Calipatria Solar Farm I & II, March 24, 2011.

<sup>9</sup> Ibid.

significant concern. Additionally, by providing onsite landscaping as described by Mitigation Measures Aes-1 and Aes-2 the project would further obscure views from off-site minimizing indirect reflection impacts.

*Glare Impact Summation*

Therefore, as the project would be constructed of non-glare materials including metal support poles to be painted per mitigation measure Aes-3, and with screening provided by intervening ridgelines, existing roadside trees, and additional onsite landscaping provided by implementation of Mitigation Measure Aes-1 and Aes-2, glare impacts to vehicle operators on Las Virgenes Road, as well as residences to the west would be less than significant.

## 5.2 AGRICULTURE

- a) **Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?**

**Less Than Significant Impact.** The Los Angeles County Important Farmland Map prepared by the California Department of Conservation (DOC) shows the project site is designated as Prime Farmland,<sup>10</sup> however no agricultural production occurs on this site. Additionally, there are no adjacent areas to the site that are actively being farmed. As the project would replace one non-agricultural use for another, and the project does not propose grading that would alter landforms or construct substantial building foundations, the project would have no impact on farmland resources. Any or all portions of the proposed solar electricity generation facility could be removed should the JPA choose to use the land for agricultural purposes. Consequently, the project would have a less than significant impact on agricultural resources.

- b) **Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?**

**No Impact.** The proposed project site is not designated under any Williamson Act contract, and no impact would occur.

- c) **Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?**

**Less Than Significant Impact.** Refer to 5.2-a above. The site is not currently farmed and the proposed project would not substantially change the existing environment landforms or soil conditions. The City of Calabasas General Plan Land Use Element does not include a land use designation for agricultural production, and does not identify any lands in the City, including the project site as farmland. Therefore, as the site is not currently used for, or zoned for agricultural production, the project would not convert farmland to non-agricultural use. Should agriculture be proposed, and approved for this site at some future time, the project's solar panels, mounting poles, and associated electrical equipment and wiring could be removed, which would revert the property to its existing condition as open space. As no agricultural production currently occurs at this site, impacts regarding conversion of farmland would be less than significant.

- d) **Would the project result in the loss of forest land or conversion of forest land to non-forest use?**

**No Impact.** There are no forest lands on the project site or in the vicinity.

---

<sup>10</sup> California Department of Conservation 2010.

- e) **Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?**

**No Impact.** Refer to 5.2-a, c, and d above. The site is not currently being farmed. The project would not create changes to the existing environment that would result in the conversion of farmland to non-agricultural use, and the site is not occupied by forest land.

### 5.3. AIR QUALITY

This section is based on the CalEEMod.2011.1.1 emissions modeling calculations included as *Appendix A*. The CalEEMod was developed by the South Coast Air Quality Management District (SCAQMD) and provides a model to calculate anticipated emissions for land use projects. Project operations would consist of the generation of electricity from a renewable resource, and would not generate air pollutant emissions from area or mobile sources with the exception of periodic maintenance activities.

**a) Would the project conflict with or obstruct implementation of the applicable air quality plan?**

***Less Than Significant Impact.*** The proposed project site is located within the South Coast Air Basin (SCAB), which includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. Air quality conditions in the SCAB are under the jurisdiction of the SCAQMD.

National Ambient Air Quality Standards (AAQS) were established in 1971 for six pollutants, with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. Because California had established AAQS several years before the Federal action, and because of unique air quality problems introduced by the restrictive dispersion meteorology that affects much of the State, there is a considerable difference between State and Federal clean air standards. These standards are the levels of air quality pollutants that are considered safe, with an adequate margin of safety, to protect the public health and welfare. Subsequent legislation such as the Federal Clean Air Act Amendments (CAAA) of 1990, and further scientific study, has resulted in modifications and additions to National and State AAQS regulations.

State and Federal laws require jurisdictions that do not meet clean air standards to develop plans and programs that will bring those areas into compliance. An Air Quality Management Plan (AQMP) typically contains emission reduction measures and attainment schedules to meet specified deadlines. The currently available AQMP that is applicable to the region where the proposed project would be located was adopted in December 7, 2012. The SCAQMD is the agency responsible for regulating air pollution in the project area.

The project is being proposed to provide electricity generation from a renewable energy source (solar) to reduce an existing electricity demand to operate a recycled water pumping station, which would not be expected to obstruct implementation of the AQMP, and impacts would be less than significant.

**b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?**

***Less Than Significant Impact with Mitigation Incorporated.*****Construction**

Dust is typically the primary concern during construction of new infrastructure. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions."

Average emissions of particulate matter 10 microns in diameter (PM-10) during project construction are shown to be about 4.01 pounds per day as calculated by CalEEMod.2011.1.1 computer model. This estimate presumes that exposed surfaces would be watered three times daily for dust suppression as mitigation. A limited amount of construction activity particulate matter is in the 2.5-micron diameter (PM-2.5) range. PM-2.5 emissions are estimated to comprise 10-20 percent of overall PM-10 emissions generated.

Enhanced dust control measures provided by SCAQMD Rule 403 that predominantly regulate grading activities, would also apply to the minor grading related to this project because of the non-attainment status of the air basin for PM-10. Some of the requirements of Rule 403 are listed below, although additional requirements may also apply:

- Apply soil stabilizers or moisten inactive areas.
- Prepare a high wind dust control plan.
- Stabilize previously disturbed areas if subsequent construction is delayed.
- Water exposed surfaces as needed to avoid visible dust leaving the construction site (typically 3 times/day).
- Minimize in-out traffic from construction zone.
- Sweep streets daily if visible soil material is carried out from the construction site.

In addition to fine particles (PM-10 and PM-2.5) that remain suspended in the atmosphere semi-indefinitely, construction activities generate larger dust particles that are chemically non-reactive and are readily filtered out by human breathing passages. These larger fugitive dust particles are therefore not regulated by an AAQS, although such particles could potentially be a soiling nuisance as they settle out on parked cars, outdoor furniture or landscape foliage. The deposition distance of most soiling nuisance particulates is less than 100 feet from the source under normal wind conditions. There are no sensitive receptors within 100 feet from the project construction site perimeter; therefore the project would not be expected to result in soiling nuisances due to large dust particles.

Construction activities also generate emissions from heavy equipment exhaust. The CalEEMod 2011.1.1 computer model was used to calculate emissions from a construction equipment fleet and schedule anticipated by CalEEMod, as well as specific equipment related to this project. As shown in **Table 5.3-1**, based on the results of the CalEEMod analysis, the worst-case daily emissions estimated for the project from construction activities would not exceed SCAQMD Thresholds for any of the criteria pollutants analyzed. Therefore, impacts due to project construction would be less than significant.

**Table 5.3-1**  
**Construction Activity Emissions Maximum Daily Emissions (pounds/day)**

<b>Construction Emissions</b>	<b>ROG</b>	<b>NOx</b>	<b>CO</b>	<b>SO<sub>2</sub></b>	<b>PM-10</b>	<b>PM-2.5</b>	<b>CO<sub>2</sub> (e)</b>
<b>2014</b>							
Unmitigated <sup>a</sup>	2.93	21.29	21.11	0.05	8.33	4.43	4,840.20
Mitigated <sup>b</sup>	2.93	21.29	21.11	0.05	4.01	2.41	4,840.20
<b>SCAQMD Thresholds</b>	<b>75</b>	<b>100</b>	<b>550</b>	<b>150</b>	<b>150</b>	<b>55</b>	<b>NA <sup>c</sup></b>
Source: CalEEMod.2011.1.1 output in appendix A.							
<sup>a</sup> Project is expected to be completed in 2014.							
<sup>b</sup> Mitigation is provided by watering exposed surfaces 3 times daily.							
<sup>c</sup> CO <sub>2</sub> (e) emissions impacts are discussed in Section 5.7 Greenhouse Gas Emissions.							

As shown in Table 5.3-1, construction activities are not anticipated to exceed SCAQMD CEQA thresholds. Nevertheless, mitigation measures are provided to ensure that construction activity emissions remain below significant levels.

### **Mitigation Measures**

#### **AQ-1:**

- Appoint a construction relations officer to act as a community liaison concerning on-site construction activity including resolution of issues related to PM-10 generation,
- Ensure that all vehicles and equipment will be properly tuned and maintained according to manufacturers specifications,
- Use materials that do not require painting when feasible,
- Use pre-painted construction materials,
- Give preference to contractors who use 2010 and newer diesel haul trucks (e.g. material delivery trucks),
- During project construction all internal combustion engines/construction equipment operating on the project site shall meet EPA-Certified Tier 2 emissions standards, or higher.
- Establish a preference for contractors using diesel particulate filters (DPF) as applicable.

### **Localized Significance Thresholds**

The SCAQMD has developed analysis parameters to evaluate ambient air quality on a local level in addition to the more regional emissions-based thresholds of significance evaluated above. These analysis elements are called Localized Significance Thresholds (LSTs), and were developed in response to the Governing Board's Environmental Justice Enhancement Initiative 1-4. The LST methodology was provisionally adopted in October 2003 and formally approved by SCAQMD's Mobile Source Committee in February 2005.

Use of an LST analysis for a project is optional. For the proposed project, the primary source of possible LST impact would be during construction. LSTs are only applicable to the following criteria pollutants: oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), and particulate matter (PM-10 and PM-2.5). LSTs represent the maximum emissions from a project that are not expected to cause or contribute measurably to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor.

The SCAQMD has issued guidance on applying CalEEMod to LSTs, and has published pollutant concentration data for 1, 2 and 5-acre sites for sensitive receptors at varying distances. The closest sensitive uses to the project site perimeter are residences located approximately 650 feet to the west, across Las Virgenes Road. A receptor distance of 200 meters was used as a reference for this project to compare with the LST screening tables. Per LST guidance, only on-site construction activity is considered in the LST analysis. **Table 5.3-2** shows that on-site emissions are below the LST for construction, and therefore, LST impacts are less than significant.

**Table 5.3-2  
Localized Significance Thresholds (LST)  
and On-Site Construction Emissions**

	CO	NO <sub>x</sub>	PM-10	PM-2.5
Localized Significance Thresholds <sup>a</sup>	3,871	250	21	7
Max. On-Site Construction Emissions <sup>b</sup>	21	21	4	2
Source: CalEEMod Output in Appendix A				
<sup>a</sup> based on a 5-acre project site at 200 meters from a sensitive receptor (West San Fernando Valley)				
<sup>b</sup> maximum mitigated emissions from on-site construction				

### **Operation**

The project's emissions during operations would be negligible as there would be no buildings to be occupied and no daily trips generated. Operations emissions would be limited to that generated by periodic maintenance activities such as inverter checks and washing, resulting in mobile emissions from service vehicles, and since the access road would not be paved, minor dust emissions could also result. These activities would generally be performed using a single vehicle; therefore emissions from these activities would be considerably less than the daily amount emitted during construction activities. As shown in Table 5.3-1, the daily emissions from all construction activities would not exceed thresholds of significance; therefore emissions from a single service vehicle accessing the site on a periodic basis would be well below any thresholds of significance. As the project operations would consist of the generation of electricity from a renewable resource and thus would not result in combustion of fossil fuels with the exception of periodic maintenance activities, operation of the project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.

**c) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

***Less Than Significant with Mitigation Incorporated.*** See response 5.3-b. Due to the non-attainment status of the SCAB for PM-10, SCAQMD Rule 403 requires that an aggressive dust control program be implemented during project construction. As shown in Table 5.3-1, compliance with Rule 403 will reduce fugitive dust emissions of PM-10 from construction activities to 4.01 lbs. per day, which would be less than three percent of the SCAQMD threshold of significance and would not be considered a cumulatively considerable net increase. Therefore, by complying with Rule 403 and incorporating mitigation measure AQ-1 as feasible, no further reductions are necessary and these construction impacts would be reduced to less than significant.

The SCAQMD's *CEQA Air Quality Handbook* identifies methodologies to determine the cumulative impact of land use projects based on performance standards and emission reduction targets necessary to attain the federal and state air quality standards identified in the AQMP. The handbook states in Table A9-14 that if the following relationship is true, then the project should be found to have a cumulatively significant impact:

**A/B > C/D Where:**

- A** is the increase in vehicle miles traveled (VMT), average daily traffic (ADT) or number of vehicles (NOV) associated with project development
- B** is the projected cumulative VMT, ADT, NOV for Los Angeles County for project build-out.
- C** is the population accommodated by the project at build-out, and
- D** is the SCAG population projection for Los Angeles County at build-out.

As the project would not generate an increase in VMT, ADT, or NOV, and would not accommodate any population at buildout, the above equation cannot be true because both numerators ("A" and "C" variables) would be zero. Additionally, this project proposes to construct a facility to generate electricity from a renewable resource, and as such would reduce emissions on a regional basis by offsetting electrical supplies currently generated by off-site utilities which combust fossil fuels in the generation of electricity. As such, based on the SCAQMD guidance and the project's reduction of long-term emissions from operation of the recycled water pump station, this project would have a less than significant cumulative impact.

**d) Would the project expose sensitive receptors to substantial pollutant concentrations?**

***Less Than Significant Impact.*** Substantial pollutant concentrations associated with development are typically found in areas directly adjacent to congested roadway intersections. These areas of vehicle congestion have the potential to be subjected to concentrations of air pollutants from exhaust fumes, creating pockets of elevated levels of CO, which are called "hot spots". As exhaust fumes from vehicular traffic are the primary source of CO, there is a direct relationship between traffic/circulation congestion and potential CO impacts.

The SCAQMD has demonstrated in its CO attainment redesignation request to EPA that there are no “hot spots”, i.e., locations where emission concentrations expose individuals to elevated risks of adverse health effects, anywhere in SCAB.

As the operations of the proposed project would not generate daily trips that would contribute to traffic impacts, impacts related to substantial pollutant concentrations would be less than significant.

**e) Would the project create objectionable odors affecting a substantial number of people?**

***Less Than Significant Impact.*** Although offensive odors seldom cause physical harm, they can be annoying and cause concern. Construction activities typically associated with strong odors, including asphalt paving and painting, would not be conducted with development of this project. Minor asphalt patching to repair trenched areas of driveways and parking lots of the Bark Park and LVMWD headquarters could potentially produce strong odors for a temporary period of time. During operations, the proposed solar panels and associated electrical equipment would not produce odors that would be noticeable offsite. Therefore the project would not generate long-term objectionable odor impacts from operations. The project could generate odors due to temporary construction activities, however such impacts would be less than significant.

## 5.4. BIOLOGICAL RESOURCES

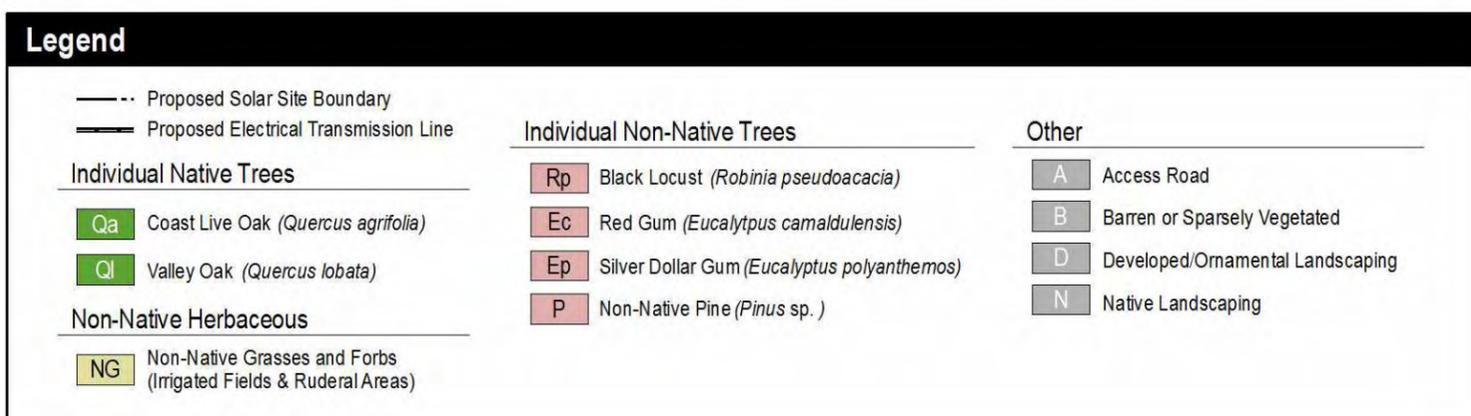
This section is based on a literature review and a field survey of the project site conducted by Mr. Jim Anderson, Senior Biologist at Envicom Corporation on February 6 and 7, 2013. The literature review included information available in standard biological references and relevant lists (e.g., California Department of Fish and Wildlife Special Animals and Special Vascular Plants, Bryophytes, and Lichens) and databases pertaining to the status and known occurrences of sensitive and special-status resources (e.g., California Natural Diversity Database and the Biogeographic Information and Observation System). The survey involved a search for protected and regulated biological resources, including rare, threatened, and endangered plant and wildlife species, special habitats, sensitive natural communities, jurisdictional wetland/non-wetland Waters of the U.S., jurisdictional streambed/riparian habitat, and locally protected resources, as well as to evaluate the importance of the site for wildlife movement. The biological survey area included the proposed solar site footprint, access road, and electrical transmission line alignment, and analysis of impacts to biological resources included the areas to be maintained as a 20-foot wide dirt access road and a 10-foot vegetation clearance buffer per fire department requirements. The biological survey area is shown on **Figure 5.4-1**, Vegetation and Land Cover Map. The entire survey area was accessible.

An inventory of vascular plants and wildlife observed within the survey area was recorded, with all species identified to the taxonomic level necessary to determine their status. Lists of vascular plants and animals observed during the survey are provided in Appendix B. Vascular plant species determinations were made using *The Jepson Manual: Vascular Plants of California*, 2nd edition. Vertebrate wildlife species observed at and in the vicinity of the site were identified by direct observation, sign (e.g., tracks, scat, or burrows), or vocalization. Wildlife species identification relied upon Reid (2006), Sibley (2009), and Stebbins (2003). Species nomenclature conforms to Baldwin, B. et al. (2012) for vascular plants, American Ornithologists' Union (2011) for birds, Baker et al. (2003) for mammals, and Stebbins (2003) for reptiles. Common plant names are from the Jepson Online Interchange. Vegetation and land cover mapping was performed using high-resolution aerial imagery of the site from August 2012 (See Figure 5.4-1). Photographs were taken as a record of site conditions at the time of the survey (**Figure 5.4-2**).

The proposed solar site consists of a rectangular upper field, separated by an embankment from an adjacent lower field. The field survey of the solar site and vicinity was conducted on a total of 9.1 acres that included the 6-acre project site on the upper field and adjacent areas. Both fields are managed, highly disturbed, and are comprised of non-native herbs, primarily grasses but also several annual and biennial forbs. The lower field has apparently been planted with a non-native perennial grass while the upper field and to a lesser extent the lower field are invaded by common non-native weeds. No native herbaceous plant species were identified at the solar site, although a few sparsely distributed native shrubs and herbs are scattered within the survey area adjacent to the access road. The District irrigates the lower "spray field" with surplus recycled water and both the upper and lower fields are routinely mowed. There are several native coast live oaks (*Quercus agrifolia*) as well as three (3) native valley oaks (*Quercus lobata*) and three (3) non-native black locust trees (*Robinia pseudoacacia*) along the slope between the two fields. These oaks were planted at the site.



Aerial Source: GoogleEarth Pro, 2012.





**Photo 1A** - View to the northwest of the proposed solar site.



**Photo 1B** - View to the southeast of the upper field at the proposed solar site.



**Photo 1C** - View to the east of the proposed solar site. The embankment and portions of the upper and lower fields are shown.



**Photo 1D** - View to the southeast of native coast live oaks on the embankment at the proposed solar site.

Vertebrate wildlife species observed during the biological survey of the project site were primarily birds and mammals common or relatively common to the region. A list of these species is provided in Appendix B. The California Fully Protected white-tailed kite (*Elanus leucurus*) was the only special-status species identified during the survey, which was observed foraging over the upper and lower fields at the solar site on February 6 and February 7, 2013. Two separate pairs of red-tailed hawks (*Buteo jamaicensis*) were observed foraging over the site and displayed breeding behavior on February 7. The project limits although lacking native habitats provide potential foraging habitat not only for raptors, but also for primary consumers such as mule deer, desert cottontail, California ground squirrel, and various other species of rodents and resident and migrating birds, as well as predators such as coyotes, bobcats, and grey foxes. The solar site and adjacent fields are frequently used by foraging animals, as evidenced by the numerous animal trails descending to the fields from surrounding natural areas.

- a) **Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or U.S. Fish and Wildlife Service (USFWS)?**

***Less than Significant, with Mitigation Incorporated***

#### **Special-Status Plant Species**

Special-status plant species either have unique biological significance, limited distribution, restricted habitat requirements, particular susceptibility to human disturbance, or a combination of these factors. Herein, the term “special-status” is used to denote those species that meet the criteria of CEQA Guidelines Section 15380 as an endangered, rare, or threatened species, whether or not officially listed, as provided in Section 15380(d). Special-status plant species include either of the following:

- Plant species that are listed, proposed for listing, or meet the criteria for listing as endangered, threatened, or rare by under the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA); or
- Plant species that are listed on the CDFW Special Vascular Plants, Bryophytes and Lichens List, which includes the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants. Plants on the CNPS List 1B (which includes rare, threatened, or endangered species, in CNPS’s opinion, in California and elsewhere) and List 2 (plants considered rare, threatened, or endangered in California, but more common elsewhere) are considered sensitive.

CEQA Guidelines, Section 15125(a), also directs that special emphasis should be placed on resources that are rare or unique to the region.

No plant species listed as rare, threatened, or endangered that would require a mandatory finding of significance pursuant to CEQA 15380 were found during the biological survey of the site. Furthermore, no special-status plant species have potential to occur within the proposed project limits due to its highly modified, disturbed, and non-native condition. A potential for occurrence analysis for special-status plant species is provided in Appendix B. As no special-

status species requiring a mandatory finding of significance under CEQA 15380 have been found or are expected at the site impacts to special-status plant species are less than significant.

### **Special-Status Wildlife Species**

For the purposes of this analysis, the term “special-status” is used to denote those species that meet the criteria of CEQA Guidelines Section 15380 as an endangered, rare, or threatened species, whether or not officially listed, as provided in Section 15380(d). Our discussion of sensitive wildlife species includes those that are:

- Listed, proposed for listing, or meet the criteria for listing as endangered, threatened, or rare by under FESA or CESA; or,
- Listed on the CDFW’s Special Animals list with a designation of CSC (California Species of Special Concern)<sup>11</sup> or CFP (California Fully Protected)<sup>12</sup>.

CEQA Guidelines, Section 15125(a), also directs that special emphasis should be placed on resources that are rare or unique to the region.

The California Fully Protected white-tailed kite (*Elanus leucurus*) was the only special-status species identified during the survey, which was observed foraging over the upper and lower fields at the solar site on February 6 and February 7, 2013. White-tailed kites likely use the solar site and the fields and non-native grasslands in the surrounding area for foraging on a routine basis, and could potentially nest in the native oak woodlands in the vicinity of the project site.

Several special-status wildlife species that were not observed during surveys of the site may occur at or in the vicinity of the site, even if in some cases only infrequently, in transit, or on a temporary basis. An assessment of the potential for occurrence of special-status wildlife species is provided in Appendix B. The potential for occurrence was undertaken through research of the CDFW Natural Diversity Database (CDFW 2013) using the Rarefind 4 application for sensitive “elements” on the Calabasas quadrangle and eight adjacent quadrangles. The potential for occurrence analysis provides a speculative assessment of the

---

<sup>11</sup> CSC – California Species of Special Concern.

A California Species of Special Concern is a species, subspecies or distinct population of an animal native to California that currently satisfies one or more of the following (not necessary mutually exclusive) criteria:

- Is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role;
- Is listed as Federally- but not State-, threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed;

Is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; and has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status

<sup>12</sup> CFP – California Fully Protected Species.

A California Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

potential for the occurrence at the site of special-status animals on the basis of their known distribution and habitat requirements.

Special-status vertebrate wildlife species that may forage regularly at the project site with varying probabilities ranging from high to low depending on the species include the coast horned lizard (*Phrynosoma blainvillii*) [CSC], white-tailed kite (*Elanus leucurus*) [CSC], northern harrier (*Circus cyaneus*) [CSC], and loggerhead shrike (*Lanius ludovicianus*) [CSC]. Additional species that may also forage rarely or occasionally with probabilities ranging from moderate to very low include golden eagle (*Aquila chrysaetos*) [CFP], mountain plover (*Charadrius montanus*) [CSC], burrowing owl (*Athene cunicularia*) [CSC], short-eared owl (*Asio flammeus*) [CSC], grasshopper sparrow (*Ammodramus savannarum*) [CSC], Vaux's swift (*Chaetura vauxi*) [CSC], black swift (*Cypseloides niger*) [CSC], and bank swallow (*Riparia riparia*) [CT]<sup>13</sup>. Five species of special-status bats listed as Species of Special Concern (CSC) may also forage aerially over the property (see Appendix B for list of potentially occurring bat species), but are not expected to roost at the site. The American badger (*Taxidea taxus*) [CSC] may also potentially forage or move through the site. The loggerhead shrike may nest in oak trees within the project limits, if present. No other potentially occurring wildlife species would inhabit or reproduce at the site, although the white-tailed kite and grasshopper sparrow could nest within native habitats in the vicinity.

The loss of 6 acres of non-native habitat would not have a substantial adverse effect on individuals or populations of these special-status species because the project site does not provide particularly important or valuable habitat for these species, and because these species would continue to use fields and undeveloped portions of the Rancho Las Virgenes property as well as natural habitats in the surrounding area, much of which is protected as open space, as foraging habitat. Also, with the exception of the coast horned lizard, which could be present with low probability in areas adjacent to the access road, but not at the solar site, all potentially occurring special-status wildlife species would be capable of escaping harm during project activities. Weed abatement adjacent to the access road would only potentially impact a very small number of individuals of the coast horned lizard, if the species is present, and would not adversely affect a coast horned lizard population that may be present in the area. Also, no special-status wildlife species would be harmed by the operation of the solar facility. For these reasons, impacts to special-status wildlife species would be less than significant.

### **Nesting Birds**

Grading and construction if conducted during the nesting bird season (February 1 to September 15) would have the potential to result in disturbances to nearby trees that could contain active bird nests. In addition, grading and construction would occur within 500 feet of native habitats that could contain active nests of raptors and other bird species, which could be susceptible to indirect impacts by increased human activity or construction noise. Project activities that result in the loss of bird nests, eggs, and young would be in violation of one or more of California Fish and Game Code sections 3503 (any bird nest), 3503.5 (birds-of-prey), or 3511 (Fully Protected

<sup>13</sup> CT (California Threatened): A native species or subspecies that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as "rare" on or before January 1, 1985, is a "threatened species."

birds). In addition, removal or destruction of one or more active nests of any other birds listed by the federal Migratory Bird Treaty Act of 1918 (MBTA), whether nest damage was due to vegetation removal or to other construction activities, would be considered a violation of the MBTA and California Fish and Game Code Section 3511, and therefore would be a significant, but mitigable impact.

### **Mitigation Measures**

#### ***Bio-1***

No earlier than 14 days prior to grading, site preparation, or construction activities that would occur during the nesting/breeding season of native bird species potentially nesting on the site (typically February 1 through August 31), a qualified biologist shall perform two field surveys to determine if active nests of any bird species protected by the state or federal Endangered Species Acts, Migratory Bird Treaty Act, and/or the California Fish and Game Code Sections 3503, 3503.5, or 3511 are present in the project limits or within 500 feet of the project limits. The second nesting bird survey shall be conducted within three days of the start of grading, site preparation, or construction activities. In the event that an active nest(s) is (are) found within the survey area, grading, site preparation, or construction activities within the 500-foot radius shall stop until consultation with the District, CDFW, and USFWS (when applicable, i.e. if the nesting birds are listed under the federal Endangered Species Act), is conducted and an appropriate setback can be established. The buffer shall be demarcated and project activities within the buffer shall be postponed or halted, at the discretion of a biological monitor, until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting.

**b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?**

#### ***Less than Significant***

### **Vegetation Communities**

There is no streambed or riparian habitat within the project limits and therefore the project would not result in impacts to habitats regulated under Section 1602 of the Fish and Game Code.

The vegetation at the solar site and adjacent to the access road and electrical line alignment consists of non-native grasses and forbs, planted trees, or developed and landscaped areas (See Figure 5.4-1, Vegetation and Land Cover). There are no sensitive plant communities or habitats within the project limits. The upper field at the solar site contains invasive bromes and mustards and other weeds typical of disturbed sites. The most prevalent species in this area are bromes (*Bromus* spp.), foxtail barley (*Hordeum murinum*), bur-clover (*Medicago polymorpha*), prickly sow-thistle (*Sonchus asper*), hoary mustard (*Hirschfeldia incana*), black mustard (*Brassica nigra*), and curly dock (*Rumex crispus*). Italian thistle (*Carduus pycnocephalus*), annual stinging nettle (*Urtica urens*), milk thistle (*Silybum marianum*), bristly ox-tongue (*Helminthotheca echioides*), small-flowered cheeseweed (*Malva parviflora*), red-stemmed filaree (*Erodium cicutarium*), and bull thistle (*Cirsium vulgare*) are also represented. The lower "spray field" is dominated by a non-native bunchgrass interspersed with other non-

native herbs, primarily curly dock. The embankment between the two fields is also weedy and highly disturbed, although several native coast live oaks (*Quercus agrifolia*) of varying sizes as well as three small native valley oaks (*Quercus lobata*) and three small non-native black locust trees (*Robinia pseudoacacia*) are planted there. The oaks at the solar site do not constitute oak woodland, but rather are a disconnected row of trees within the fields. The embankment and the vegetated areas adjacent to the access road that would be improved and beneath which the electrical transmission line would be buried contain non-native species such as red-stemmed filaree, hoary mustard, tecolote (*Centaurea melitensis*), and red brome (*Bromus madritensis*), and as well as scattered native plants including deerweed (*Acmispon glaber*), telegraph weed (*Heterotheca grandiflora*), and California aster (*Corethrogyne filaginifolia*). Due to their non-native, managed, and disturbed condition, the plant communities within the project limits are not sensitive and project impacts to plant communities would be less than significant.

**c) Would the project have a substantial adverse effect on federally protected wetlands (including marshes, vernal pools, and coastal wetlands) or waters of the United States, as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means?**

**No impact.** There are no federally protected wetlands or jurisdictional waters of the U.S. within the proposed project limits.

**d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?**

**Less than significant impact.** The project site does not contain a native wildlife nursery site.

The term wildlife movement corridor is used to describe physical connections that allow wildlife to move between patches of suitable habitat in both undisturbed landscapes as well as environments fragmented by urban development to access essential habitat for water, foraging, breeding, and cover. Wildlife movement corridors are necessary for dispersal and migration, to ensure the mixing of genes between populations, and so wildlife can respond and adapt to environmental stress. Examples of barriers or impediments to movement include housing and other urban development, roads, fencing, unsuitable habitat, or open areas with little vegetative cover. Wildlife crossings are generally small, narrow areas allowing wildlife to pass through an obstacle or barrier, such as a roadway to reach another patch of habitat. These can be critical at both the local and regional level. Wildlife crossings include culverts, drainage pipes, underpasses, tunnels, and, more recently, crossings created specifically for wildlife movement over highways.

To assess the project's impacts on wildlife movement, the City of Calabasas General Plan, the Santa Monica Mountains National Recreation Area (SMMNRA) Land Protection Plan (National Park Service, March 1998), and the South Coast Missing Linkages Project: A Linkage Design for the Santa Monica Mountains-Sierra Madre Connection (Penrod, K., 2006) were reviewed to determine if the project site is within an area that has been identified as an important wildlife corridor or an important linkage necessary for maintaining connectivity between large areas of core natural habitat. The project site was also evaluated in conjunction with surrounding habitats

for its potential importance to wildlife movement both in the field and by reviewing recent aerial photographs of the area.

The solar facility would be developed within a habitat linkage for wildlife movement, which is identified in all three of the above-mentioned documents. Within the City of Calabasas, the linkage encompasses a wide swath of habitats located to the east of Las Virgenes Road, which extend from the southern city limits near Mulholland Road to the north of the 101 Freeway. The linkage is shown on Figure IV-1, Significant Ecological Areas, Linkages, and Corridors of the City of Calabasas General Plan. The linkage identified in the City's General Plan is part of a regional habitat linkage referred to as the Santa Monica-Sierra Madre Connection, which is important for facilitating wildlife movement and maintaining habitat connectivity between the Santa Monica Mountains and inland habitats, including the Simi Hills and Sierra Madre Mountains. The Draft Los Angeles County General Plan also identifies the project site as within a regional habitat linkage. As discussed in Missing Linkages: Restoring Connectivity to the California Landscape (Penrod, K., November 2, 2000), the Santa Monica-Sierra Madre Connection habitat linkage was given a 3 out of 5 overall threat rank by participants of the Missing Linkages conference held in November 2000, which was cosponsored by the California Wilderness Coalition, Nature Conservancy, and United States Geological Survey, where 1 = no threat/secure and 5 = severe threat/loss imminent. Scores of 4 or 5 are considered severely threatened.

Although the solar facility would be developed within an important habitat linkage, development of the facility would not interfere substantially with wildlife movement or have a significant adverse effect on the value of the linkage for wildlife movement.

Wildlife would likely avoid the facility, as the ground surface of the facility would not be vegetated, and would prefer to use adjacent fields or natural areas in the vicinity of the site for movement. However, as the facility would not be fenced, the facility would not represent a barrier to movement and wildlife could pass through the array by moving between the solar panels. No artificial night lighting is proposed that could dissuade wildlife from using the surrounding area.

The loss of habitat for wildlife movement within the linkage would not be significant considering the non-native and managed condition of the project site, as well as the remaining width and area available within the linkage. As discussed, the solar array would be sited on an open, disturbed field of non-native herbs, which is routinely mowed. The field is of relatively low overall habitat value and lacks protective cover for wildlife. Where the facility would be constructed, the linkage is approximately 0.7 miles wide. With development of the facility, an approximate 0.35-mile wide swath of native habitats within the linkage to the east of the project site would continue to provide opportunities for wildlife movement through the area. Also, wildlife could continue to pass through fields and disturbed areas to the west of the solar array and east of Las Virgenes Road.

The project would only result in the loss of low value, disturbed non-native habitat within the linkage and would not represent a barrier to movement or disrupt the overall capacity of the habitat linkage to provide opportunities for dispersal of fauna over the short or long-term. Therefore, impacts to wildlife movement are considered to be less than significant.

The project site does not contain a native wildlife nursery site. To assess the project's impacts on wildlife movement, the City of Calabasas General Plan, the Santa Monica Mountains National Recreation Area (SMMNRA) Land Protection Plan (March 1998), and the South Coast Missing Linkages Project: A Linkage Design for the Santa Monica Mountains-Sierra Madre Connection (2006) were reviewed to determine if the project site is within an area that has been identified as an important wildlife corridor or an important linkage necessary for maintaining connectivity between large areas of core natural habitat. The project site was also evaluated in conjunction with surrounding habitats for its potential importance to wildlife movement through field investigation and review of recent aerial photographs of the area.

The City of Calabasas General Plan (Figure IV-1, Significant Ecological Areas, Linkages, and Corridors) identifies the project site as within a wildlife linkage. The wildlife linkage included in the City's General Plan encompasses a wide swath of natural habitats located to the east of Las Virgenes Road that extend from the southern city limits near Mulholland Road to the 101 Freeway, as well as north of the 101 Freeway. These areas are part of a landscape-scale habitat linkage referred to as the Santa Monica-Sierra Madre Connection, which is important for facilitating wildlife movement and maintaining habitat connectivity between the Santa Monica Mountains and inland habitats, including the Simi Hills and Sierra Madre Mountains (Penrod, K. et. al., 2006). These areas are also identified as part of an important habitat linkage in the SMMNRA Land Protection Plan.

General Plan Policy IV-2 directs that the City should ensure that new developments maintain the biotic habitat value of habitat linkages.

The solar facility would be developed within a habitat linkage, and although wildlife could continue to pass through the facility between the solar panels (the facility would not be fenced), the facility would deter wildlife movement, as the ground surface of the facility would not be vegetated. Wildlife would likely avoid the facility, preferring to use adjacent vegetated areas or natural areas in the vicinity of the project site for movement.

Although installation of the facility would fragment the habitat linkage somewhat by introducing infrastructure where none previously existed, the project would not represent a barrier to movement or disrupt the capacity of the habitat linkage to provide opportunities for dispersal of fauna over the short or long-term. Also, the project would not result in removal of native habitats within the habitat linkage, and no artificial night lighting is proposed that could dissuade wildlife from using the area. Therefore, impacts to wildlife movement are considered to be less than significant.

**e) Conflict with any local policies or ordinance protecting biological resources, such as a tree preservation policy or ordinance?**

***Less than Significant, with Mitigation.*** Oak trees and scrub oak habitat (species in the genus *Quercus*) within the City of Calabasas are protected by the City's Oak Tree Ordinance. A permit is required to cut, relocate, or remove oak trees that are larger than 2 inches in diameter at any location above the tree's natural grade. A permit is also required for encroachment within a

qualified oak tree's (also larger than two inches in diameter at any location above the tree's natural grade) protection zone, which is defined as five feet beyond the dripline and in all cases at least 15 feet from the trunk of the tree, or in the case of oak trees that are larger than 24" in diameter at least 50 feet from the trunk of the tree.

There are several ordinance-sized coast live oaks (*Quercus agrifolia*) and valley oaks (*Quercus lobata*) located on the slope between the upper and lower fields in near proximity to the project site (See Figure 5.4-1). These oak trees were planted at the site.

Final plans for the project have not been prepared at a scale that clearly depicts the proposed extent of ground disturbing activities in relation to the oak tree protection zones. When the project design is finalized, a site plan would be provided at a scale that can clearly show the relationship between areas to be disturbed by construction and the oak tree protection zones. A mitigation measure has been incorporated to insure that final site plans clearly demonstrate that the protection zones will not be encroached upon by ground disturbing activities. As the existing project site boundary maps do not provide information on the exact extent of ground disturbance activities, and are not provided at a scale that a determination can be made if tree protection zones would be avoided, impacts to oak trees are considered to be significant, but mitigable. Mitigation stated below would reduce potentially significant impacts to oak trees to less than significant.

### **Mitigation Measures**

#### ***Bio-2***

Final site plan drawings shall be provided that clearly demonstrate that all ground disturbance activities would not encroach into any oak tree protection zone as defined by City ordinance. City ordinance defines the protection zone as 5 feet from the canopy dripline, and no less than 15 feet from the tree trunk.

#### **f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?**

**No impact.** The project site is not located within a Habitat Conservation Plan, Natural Community Conservation Plan, or other such plan. The Palo Comado Canyon Significant Ecological Area (SEA No. 12) is located approximately 0.6 miles to the northeast, and would not be impacted by the project due to the lack of a significant nexus between the SEA and the project site.

## 5.5 CULTURAL RESOURCES

**a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?**

**No Impact.** The City of Calabasas General Plan includes a map of Cultural Resource Sensitivity Areas, which indicates that the project site would not be considered to be sensitive, however the hillsides and ridges adjacent to the eastern border of the site are designated as such. The project does not propose significant ground disturbance activities to construct the solar panel facility on the site, which has been previously disturbed by land clearance, grading, and grubbing activities. Additionally, all trenching activities for installing underground cables would occur within previously disturbed areas of dirt roads or paved areas. Therefore, it is not expected that the project would encounter any unknown historical resources and impacts would be less than significant.

**b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?**

**No Impact.** Refer to response 5.5-a.

**c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?**

**Less Than Significant Impact.** The project site is not located in a Potential Cultural Resource Area as designated by the City's 2030 General Plan. Because the current City General Plan does not indicate that unique paleontological resources may occupy the site, and due to the site being located on fill material that has been periodically graded and grubbed for vegetation maintenance, the project would not be anticipated to uncover paleontological resources during construction, and impacts would be less than significant.

**d) Would the project disturb any human remains, including those interred outside of formal cemetery?**

**No Impact.** Refer to response 5.5-a. The site has been previously disturbed by grading and by ongoing periodic tilling activities for vegetation control. Additionally, due to the previous grading of the site, construction of the facility would require minimal ground disturbance to ensure a two percent grade across the site to facilitate drainage. Therefore, the potential for construction activities to encounter human remains would be considered minimal.

## 5.6 GEOLOGY AND SOILS

a) **Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:**

- i) **Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.**

***Less Than Significant Impact.*** There are no known active or potentially active faults that cross the project site, and the site is not within an Alquist-Priolo Earthquake Fault Zone as defined by the State Geologist. As the project site is not located within a State designated Earthquake Fault Zone, the potential for ground rupture due to faulting onsite is considered remote.

- ii) **Strong seismic ground shaking?**

***Less Than Significant Impact.*** Although no active faults have been mapped within the City of Calabasas, the City lies in a seismically active region that is prone to occasional earthquakes.<sup>14</sup> Significant earthquakes have occurred within a 40-mile radius of the Site within the last 40 years, most notably the 1994 Northridge earthquake centered approximately 13 miles to the northeast of the project site. Other major faults in this region of Southern California include the San Andreas Fault Zone, the Newport-Inglewood Fault, and the San Fernando-Sierra Madre Fault Zone, which are located approximately 40 miles to the north, 20 miles to the southeast, and 18 miles to the northeast of the project site respectively. While a certain level of exposure to seismic ground shaking is expected for practically all development within seismically active southern California, the project does not propose facilities that would be inhabited as either residences or a place of employment, therefore, the risk of loss, injury, or death from seismic ground-shaking is less than significant.

- iii) **Seismic-related ground failure, including liquefaction?**

***Less than Significant Impact.*** Liquefaction is a seismic phenomenon where saturated soils lose strength when severely shaken and develop excess pore pressures. This phenomenon is currently understood to be of concern in the upper 50 feet of the subsurface profile. The subject site is shown to be within an area susceptible to seismically induced liquefaction on the California Geological Survey Seismic Hazard Zones Map for the Calabasas Quadrangle. However, as no residents or employees would occupy the site on a regular basis, impacts would be less than significant.

---

<sup>14</sup> City of Calabasas, 2030 General Plan EIR, December 2008.

**iv) Landslides**

**Less than Significant Impact.** Landslide hazard areas are generally considered to exist when substantial slopes are located on or immediately adjacent to a property. The California Public Resources Code defines an earthquake-induced landslide area as an area where previous occurrence of landslide movement, or local topographic, geologic, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation would be required.

The subject site is shown to not be within an area susceptible to earthquake-induced landslides on the California Geological Survey Seismic Hazard Zones Map for the Calabasas Quadrangle. Additionally, as no residents or employees would occupy the site on a regular basis, impacts would be less than significant.

**b) Would the project result in substantial soil erosion or the loss of topsoil?**

**Less Than Significant Impact.** The project would not result in substantial grading or landform altering activities that could lead to an appreciable increase in soil erosion or loss of topsoil. Although the site has previously been graded to a near level condition, construction would include minor grading of the site to ensure adequate drainage from the site. During any grading activities, a water truck would spray the site to control dust, which would minimize the loss of topsoil. Additionally, the water truck would also be employed to control dust from the onsite dirt roads that would be used by construction workers onsite. Impacts would be less than significant.

**c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in, on or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?**

**Less Than Significant Impact.** See responses to 5.6 a) i – iv and b) above.

**d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks of life or property?**

**Less Than Significant Impact.** Expansive soils contain clay particles that change in volume (shrink or swell) due to a change in the soil moisture content. This effect can cause distress to foundations as either uplift, or settlement. See responses to 5.6 a) i – iv above for discussion of risks from geologic hazards.

**e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?**

**No Impact.** The project would not provide facilities that would require onsite wastewater treatment, and no septic tanks or wastewater disposal systems are proposed. No impact would occur.

## 5.7. GREENHOUSE GAS EMISSIONS

Certain gases emitted by human activity have been implicated in global climate change, and are commonly referred to as greenhouse gases (GHG) due to their role in trapping heat near the surface of the earth. The following analysis is based on the CalEEMod.2011.1.1 emissions modeling calculations included as Appendix A. The CalEEMod was developed by the South Coast Air Quality Management District (SCAQMD) and provides a model to calculate operational emissions of greenhouse gases (expressed as CO<sub>2</sub>(e)) from development projects. This analysis was performed for construction activities only, as operations of the solar powered electricity generating facility would reduce GHG emissions<sup>15</sup> relative to existing conditions. It is noted that SCAQMD recommended mitigation measures for projects that exceed allowable GHG emission thresholds include the provision of solar powered generation facilities (such as this proposed project). Therefore implementation of this project would be recognized as a means of reducing long-term GHG emissions.

**a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

***Less Than Significant Impact.*** For purposes of planning and regulation, Section 15364.5 of the California Code of Regulations defines GHGs to include carbon dioxide (CO<sub>2</sub>), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These gases have varying potentials for trapping heat in the atmosphere, so for analysis of impacts, these emissions are reported as a cumulative amount of all of these regulated gases, modified by the proportional heat trapping potential of each one relative to that of CO<sub>2</sub>. The resulting amount is reported as a carbon dioxide equivalent, or CO<sub>2</sub>(e).

California has passed several bills regarding GHG regulations, including Assembly Bill (AB) 32. A major component of AB 32 related to development such as the proposed project is a mandate that California's GHG emissions be reduced to 1990 levels by 2020, which forces an overall reduction of GHG emissions by 25-40%, from "business as usual". Section 15064.4 of the California Code of Regulations specifies a process for evaluating the significance of GHG emissions by quantifying a project's emissions, determining if they are significant, and specifying mitigation if impacts are found to be potentially significant. At each of these steps, the guidelines afford the lead agency substantial flexibility.

The SCAQMD Governing Board adopted an Interim quantitative GHG Significance Threshold on December 5, 2008 of 10,000 Metric Tons (MT) CO<sub>2</sub>(e) per year for industrial projects where the SCAQMD is the lead agency (e.g., stationary source permit projects, rules, plans, etc.). In September 2010, SCAQMD provided revisions that recommended a threshold of 3,500 MT CO<sub>2</sub>(e) per year for residential/commercial projects. This recommended 3,500 MT annual emissions threshold has been used as a significance guideline for this analysis.

---

<sup>15</sup> The proposed facility would provide electricity from solar energy which does not produce greenhouse gases, and the facility would not include onsite staff (except for periodic maintenance), therefore GHG emissions from mobile sources and energy use would be minimal. Additionally, the project would reduce the amount of SCE electricity and associated GHG emissions which currently result from operation of the existing recycled water pump station.

**Construction Activity GHG Emissions**

The CalEEMod air quality computer model (discussed in Section 5.3, *Air Quality*), estimated that construction activities for this project would occur over approximately 12 months and would generate a total of 269.66 MT CO<sub>2</sub>(e) emissions. SCAQMD GHG emissions policy for evaluating impacts from construction activities is to amortize emissions over a 30-year lifetime, which yields an amortized level of less than 9 MT CO<sub>2</sub>(e) emissions per year for build-out of this project. The resulting amortized emissions are below the applicable significance thresholds.

**Operational GHG Emissions**

The proposed facility would provide electricity from solar energy which does not produce greenhouse gases, and the facility would not include onsite staff (except for periodic maintenance), therefore GHG emissions from mobile sources and energy use would be minimal and would not exceed significance thresholds. Additionally, the project would reduce the amount of SCE electricity currently provided to operate the existing recycled water pump station by 50 percent, or 2.4 million kWh annually. The 50 percent reduction in demand for off-site generated electricity also represents a greater than 25-40 percent reduction in “Business as Usual” GHG generation. Therefore, impacts related to GHGs would be less than significant.

**b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?**

***Less Than Significant Impact.*** See response to 5.7a. The project’s GHG emissions would not exceed the applicable significance thresholds that have been adopted or recommended for the State’s compliance with AB 32. As this project would generate electricity from a renewable resource, it would not be in conflict with any plan, policy, or regulation that has been adopted to reduce GHG emissions, therefore this impact would be less than significant.

## 5.8. HAZARDS AND HAZARDOUS MATERIALS

### a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

**No Impact.** Development and operation of the project would not involve the use of explosives or acutely hazardous materials. Therefore, the project would have no impact with regard to creating a potential hazardous condition to the public or the environment through routine transport, use, or disposal of hazardous materials.

### b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

**Less than Significant Impact.** Relatively small amounts of hazardous substances, such as lubricants, and solvents would be used onsite for construction and maintenance of the project; however, these materials shall be transported and handled in accordance with all federal, state, and local laws regulating the management and use of hazardous materials. Consequently, use of these materials for their intended purpose would not pose a significant risk to the public or environment, and impacts would be less than significant.

### c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

**Less Than Significant Impact.** The closest school is A.E. Wright Middle School of the Las Virgenes unified School District, located at 4029 N. Las Virgenes Road, which is approximately 650 feet (approximately 0.12 mile) west of the project site. As analyzed in response 5.8-a, during the operational phase, the project would not generate hazardous emissions or handle acutely hazardous materials. As described in response 5.8-b, hazardous materials used during the construction phase, such as fuels, solvents, or coatings shall be transported, handled, and disposed of in accordance with all federal, state, and local laws regulating the management and use of hazardous materials. Therefore, due to existing management protocols regarding handling or transportation of hazardous materials during construction, and because no hazardous materials would be stored on the site during operations, potential impacts are considered less than significant.

### d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

**No Impact.** Based on data provided by the Department of Toxic Substances Control (DTSC),<sup>16</sup> the project site has not been identified on a list of hazardous materials sites. As the project would not be located on a site identified as a significant hazard to the public or the environment, no project impacts would occur.

---

<sup>16</sup> California Department of Toxic Substances Control, EnviroStor, accessed at <http://www.envirostor.dtsc.ca.gov> on February 4, 2013.

- e) **For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?**

**No Impact.** The nearest airport is the Van Nuys airport approximately 12 miles to the northeast. Given this distance, no feature of the project would result in a safety hazard in this regard.

- f) **For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

**No Impact.** Refer to response 5.8-e. No private airstrips have been identified in the vicinity.

- g) **Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

**Less Than Significant Impact.** The project would be located approximately 600 feet from Las Virgenes Road and thus would not physically interfere with any emergency response or evacuation plan associated with that roadway. The project would not add to the population in such a way that would interfere with any emergency response or evacuation plans. The construction of the project would not result in soil export/import activities, however materials delivery trucks would temporarily add to traffic accessing the site. Such traffic would be temporary in nature and would not significantly interfere with emergency response or evacuation plans. Impacts would be less than significant.

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

**Less Than Significant Impact.** The subject site is located in a Very high fire hazard Severity zone as delineated by the County of Los Angeles Fire Department. Although the site is surrounded by urban development to the west, the eastern portion of the site is bounded by preserved open space. The project would incorporate ongoing vegetation clearance per Los Angeles County Fire Department Fuel Modification Guidelines to provide a defensible buffer around the facility consisting of a 20-foot wide perimeter dirt access road and a 10-foot vegetation clearance buffer. The Project would not be staffed and therefore would not expose people to risk of injury or death. The solar panels, supporting poles, and associated electrical equipment could potentially be damaged by fires, however if such damage were to occur, the recycled water pump station would still be able to function by drawing from SCE electricity supplies until such time as repairs to the solar electricity generation facility could be made. Therefore, impacts are considered less than significant.

## 5.9. HYDROLOGY AND WATER QUALITY

### a) Would the project violate any water quality standards or waste discharge requirements?

***Less Than Significant Impact with Mitigation Incorporated.***

#### **Construction**

During construction, pollutants could be transported offsite, draining towards Las Virgenes Road. The JPA maintains a debris basin near Las Virgenes Road that manages runoff from the project site including first flush stormwater runoff. Stormwater runoff could potentially drain from the site if not captured by the debris basin and enter existing storm water conveyance systems, including Las Virgenes/Malibu Creek, which is currently listed on the State Water Resource Control Board's 303(d) list of impaired water bodies for coliform, nutrients, organic enrichment, scum, sedimentation, selenium, and trash (2002, CWA Section 303(d), List of Water Quality Limited Segments, LA RWQCB).

The construction phase of the project would result in disturbed soils from minor finish grading, trenching along approximately 2,500 linear feet to install underground cable, and minor disturbance onsite during installation of the solar panels mounting apparatus. Disturbed soils could create the potential for offsite sediment transport. Sediment that leaves the site would likely be deposited in either Las Virgenes or Malibu Creek, where such sedimentation could adversely affect aquatic habitat. Sedimentation related to construction sites can typically be caused by erosion of unprotected graded slopes and poor stockpile management. This project does not propose substantial grading activities, and would not be expected to require onsite soil stockpiles. Commonly used construction materials can also pollute downstream water resources if the materials are allowed to be carried offsite with stormwater runoff, or soak into the soil. This short-term impact is considered potentially significant. However, mitigation measure WQ-1 would reduce construction runoff impacts to below a level of significance.

#### **Operation**

Development projects can in general potentially introduce pollutants into the storm drain system if such materials are not properly used, stored, and disposed of by on-site maintenance personnel. If pollutants were to come into contact with runoff water, either by negligence or accident, they could potentially be carried by stormwater or irrigation runoff and discharged into the Las Virgenes or Malibu Creeks, which could result in significant surface water quality impacts. Groundwater impacts can also result from the transport of chemicals within a fluvial system.

The project would not significantly increase runoff water from the site, as areas beneath proposed solar panels would remain pervious. Proposed electrical equipment associated with operation of the facility would be placed on an impervious concrete slab of approximately 120 square feet, which would not be expected to result in significant impact to runoff quantity. As potential chemical pollutants would not be stored onsite, sediment carried by runoff water would be the most likely type of pollutant on the project site. As the project site and adjacent lands of the JPA Rancho Las Virgenes property are currently used to dispose of excess recycled water by spray irrigation and infiltration, and an existing debris basin is maintained to detain first flush

stormwater flows, onsite infiltration would likewise be the most feasible treatment for stormwater to minimize sediment transport. Operational impacts related to water quality standards would be less than significant.

### **Mitigation Measures**

#### **WQ-1:**

During construction activities, disturbed soils from trenching operations shall be used to backfill the trench to existing ground elevations following installation of the cables and/or conduit as proposed. Where trenching requires pavement cutting, the trenches shall be backfilled and the pavement will be patched. Pavement cuttings shall be recycled if feasible, or disposed of off-site pursuant to applicable regulations for such material.<sup>17</sup> The project applicant shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the State Water Resources Control Board Waste Discharge Requirements for Discharges for Storm Water Runoff Associated With Construction and Land Disturbance Activities.<sup>18</sup> The SWPPP shall be subject to review and approval by the Regional Water Quality Control Board. The applicant shall monitor adherence to the requirements contained in the SWPPP and as stipulated in the General Permit, including specific monitoring, sampling, and testing procedures for stormwater leaving the site as applicable.

- b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of a local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?**

***Less Than Significant Impact.*** The project would not use groundwater supplies, and would not interfere with groundwater recharge as the majority of the site would remain pervious. Therefore, less than significant impacts to groundwater are anticipated.

- c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or offsite?**

***Less Than Significant Impact.*** The proposed project would not introduce significant impervious surfaces at the site, which would remain permeable ground with the exception of an approximately 300-square foot foundation to support associated electrical equipment. Impervious surfaces intercept rainfall that would otherwise naturally percolate into the soil onsite, and generally will convey stormwater runoff to be discharged into local waterways. A potential increase in runoff from a site when compared to preconstruction conditions could increase erosion or siltation of downstream facilities. Although the project would cover up to six acres, the proposed solar panels would be installed on poles at a height of three feet above

---

<sup>17</sup> Asphalt waste is accepted at the Calabasas Landfill operated by the County of Los Angeles approximately 2.5 miles from the project site.

<sup>18</sup> State Water Resources Control Board, Order No. 2009-0009-DWQ 9 as amended by Order No. 2010-0014-DWQ) National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002, September 2, 2009 (modified November 16, 2010).

ground, with the ground beneath remaining permeable in order to allow stormwater infiltration and prevent increased runoff quantities inundating downstream receiver water bodies. Therefore, this project would not significantly alter existing onsite drainage patterns. Likewise, the project would not alter offsite drainage patterns and would not involve redirection of a stream or river.

Stormwater runoff that is not infiltrated onsite would continue to be directed to an existing debris basin maintained by the JPA near Las Virgenes Road as it is under the existing condition. By not significantly altering drainage patterns across the site, the project would not be expected to create erosion or siltation problems on- or off-site. Therefore, this impact would be less than significant.

- d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite?**

***Less Than Significant Impact.*** Refer to response 5.9-c. This impact would be less than significant.

- e) Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?**

***Less Than Significant Impact.*** See response 5.9-c. When stormwater exceeds the infiltration capacity of the project site, runoff from the project area currently surface drains in a westerly direction to a debris basin on the property's western boundary at Las Virgenes Road. As the subject property's topography directs runoff to a stormwater management debris basin without traversing adjacent properties, the project would not adversely affect the hydrologic conditions of other properties in the vicinity. With implementation of the proposed project, runoff would continue to be directed to the existing stormwater drainage system near Las Virgenes Road.

The City of Calabasas Municipal Code requires that all development runoff shall not exceed that of pre-development. The project would not significantly increase impervious surfaces, allowing stormwater to continue to infiltrate onsite as it does under existing conditions. As a result, the project would not create or contribute runoff flow rates in excess of that which the site currently contributes to the local stormwater system, and thus would not exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Therefore, impacts would be less than significant.

- f) Would the project otherwise degrade water quality?**

***Less Than Significant Impact.*** Refer to responses 5.9-a through 5.9-e.

**g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary of Flood Insurance Rate Map (FIRM) or other flood hazard delineation map?**

**No Impact.** The project does not propose to construct housing or any habitable structures. Therefore no impact would be anticipated.

**h) Would the project place within a 100-year flood plain structures, which would impede or redirect flood flows?**

**No Impact.** Refer to response 5.9-e. The project site is not located within a 100-year floodplain,<sup>19</sup> therefore the project would have no impact regarding a 100-year flood plain. Additionally, the proposed solar panels would be mounted on poles approximately three feet above ground, which would not impede or redirect flood flows.

**i) Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?**

**No Impact.** There are no levee or dam structures located upstream of the project site within the subwatershed where the site is located.

**j) Would the project expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?**

**Less Than Significant Impact.** See response 5.9-d. There are no structures or reservoirs located upstream of the project site within the subwatershed where the site is located that would pose a risk of seiche. The project site would not be at risk from tsunami hazards as it is not located in a tsunami hazard zone and is approximately seven (7) miles inland. Although the site is adjacent to a hillside, the project would not place habitable structures on the site, therefore risk of loss, injury or death would be less than significant.

---

<sup>19</sup> FEMA FIRM: Los Angeles County, California (and Incorporated Areas), Map Number 06037C1264F, September 26, 2008.

## 5.10. LAND USE AND PLANNING

### a) Would the project physically divide an established community?

**No Impact.** The project would be located at a transitional zone where urban land uses exist adjacent to open space. Existing land uses in the vicinity of the project site include Las Virgenes Road, residential neighborhoods, and a school to the west; open space to the east; a neighborhood park and open space to the north; and open space and JPA properties including a composting facility to the south. No communities would be physically divided by the proposed project.

### b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

**Less Than Significant Impact.** The project site is designated by the City of Calabasas General Plan as Open Space – Resource Protection (OS-RP) and is zoned Open Space. The City’s zoning map designates a Scenic Corridor along Las Virgenes Road that includes the segment adjacent to the subject property and extends 500 feet outward from the roadway.

#### City of Calabasas 2030 General Plan

The OS-RP designation applies to lands whose primary purpose is the protection of public health and safety, preservation of sensitive environmental resources, or resource management. The project would be consistent with policies provided in the Open Space Element of the City’s General Plan. Specifically, the Open Space Element includes Policy III-2 to “limit the permitted intensity of development within lands designated as open space to that which is consistent with the community’s environmental values and that will avoid significant impacts to sensitive environmental features, including but not limited to woodlands, riparian areas, wildlife habitats, wildlife movement corridors, and habitat linkages.” As discussed in Section 5.4 Biology, the project would be consistent with this policy in that significant impacts would be avoided to sensitive environmental features as listed in this Policy.

The Open Space Element also includes Policy numbers III-5, III-7 and III-14 which address limiting landform modification within designated open space areas to preserve ridgelines and other significant landforms, incorporating native or transitional landscape screening for development within and adjacent to designated open space areas and the preservation of significant ridgelines, respectively.

With regard to Policy III-5, the project will involve minimal grading and therefore will not modify the project site’s landform to the extent that it will significantly impact ridgeline views or that of other significant landforms. Consistency with Policy III-7 is demonstrated by the existence of roadside trees that provide screening, and through the requirement of mitigation measure Aesthetics-1 to incorporate additional trees along the near-continuous line of trees (deciduous and evergreen) along Las Virgenes Road to fill existing gaps, except where gaps are needed for site access. Lastly, the project will be consistent with Policy III-14 in that the overall size and extent of the project, once completed, will not severely impact views of significant ridgelines.

The project would also be consistent with the General Plan's Conservation Element; specifically Policy numbers IV-37 through IV-39, which promote the use of solar energy and the incorporation of solar energy into existing developments.

### **Las Virgenes Road Corridor Design Plan**

The project would be constructed along a portion of Las Virgenes Road that is designated as a scenic corridor. The project site is approximately 600 to 1,600 feet from Las Virgenes Road, which is beyond the 500-foot limit described as the Scenic Corridor Overlay Zone, however the site is located between the roadway and a significant ridgeline, and therefore would be subject to the Las Virgenes Road Scenic Corridor Design Guidelines. As discussed in Section 5.1 Aesthetics, this project would not conflict with the design guidelines for the Las Virgenes Road Scenic Corridor. Specifically, the project would be located at a substantial setback from the roadway and would be situated on the property where potential views from the roadway would be minimized. Additionally, an existing row of trees, consisting of a mix of deciduous and evergreen varieties, provides substantial screening of the site, and mitigation measure Aesthetics-1 would provide for additional trees as appropriate to fill gaps in the row of trees, providing additional screening. The Las Virgenes Road Corridor Design Plan also addresses planned traffic improvements, which the project would not obstruct or impact. As such, the project would be consistent with the Las Virgenes Road Corridor Design Plan, and no conflicts with this design plan or impacts would result.

### **Southern California Association of Governments**

The Southern California Association of Governments (SCAG) serves as the Metropolitan Planning Organization with the responsibility to establish regional land use and transportation policy. This responsibility includes a mandate by the federal government to research and develop plans for transportation, growth management, hazardous waste management, and air quality. SCAG consists of six regional planning sub-areas. The proposed project is located within the Los Angeles sub-region.

The Southern California Association of Governments (SCAG) addresses regional planning issues in its 2008 Regional Comprehensive Plan (RCP). The RCP is a major advisory plan prepared by SCAG that has been designed to address the future of development within the region through the year 2035 and contains chapters on Land Use and Housing, Open Space and Habitat, Water, Energy, Air Quality, Solid Waste, Transportation, Security and Emergency Preparedness, and the Economy.

SCAG also acts as an area-wide clearinghouse for regionally significant projects and is charged with the responsibility of reviewing such projects for consistency with regional plans. Based on CEQA Guidelines Section 15206, the size and scope of the proposed project does not meet the criteria for what is considered a regionally significant project. Therefore, impacts on regional land use planning are considered less than significant.

**c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?**

**No Impact.** Refer to response 5.4-f. The project site is not located within a Habitat Conservation Plan, Natural Community Conservation Plan, or other such plan.

## 5.11 MINERAL RESOURCES

- a) **Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?**

**No Impact.** No historical mining activities are known to have occurred directly on or adjacent to the project site. The California Geologic Survey designates areas in the western portion of Calabasas as Mineral Resource Zone (MRZ) 1, indicating that no significant mineral deposits are present. The remainder of the City is designated MRZ 3, indicating that the significance of mineral resources could not be evaluated from the available data. The Calabasas General Plan Policy IV-46 prohibits the extraction of mineral resources that could result in significant environmental impacts. As such, it is unlikely that any mineral extraction activities would be approved on this site; therefore there would be no impacts to mineral resources.

- b) **Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?**

**No Impact.** See response 5.11-a.

## 5.12. NOISE

- a) **Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?**

***Less Than Significant Impact with Mitigation Incorporated.*** The Noise Element of the City of Calabasas General Plan establishes interior and exterior noise guidelines and noise limiting criteria for proposed noise-sensitive land use developments within the City. For planning purposes, noise levels are quantified on a scale that is more heavily weighted to factor in frequencies that fall within the maximum human sensitivity range. The noise levels evaluated are then expressed as A-weighted decibels (dBA).

State law requires that for planning purposes, noise levels measured during evening and nighttime hours are given an artificial increase of 5 dB and 10 dB respectively, recognizing that a community is more sensitive to unwanted noise intrusion during these quiet times. A 24-hour noise measurement that incorporates these evening and nighttime penalties for noise levels are called the Community Noise Equivalent Level (CNEL).

For residential uses, the City requires indoor noise exposure to be limited to 45 dB CNEL. Since normal noise attenuation within residential structures with closed windows is about 20 dB, an exterior noise exposure of 65 dB CNEL allows the interior standard to be met without any specialized structural attenuation.

Therefore, in order to protect the health and welfare of residents, the City recommends an exterior noise exposure of 65 dB CNEL for residences and for public facilities such as schools. Noise levels up to 70 dB CNEL are considered “conditionally acceptable” and are permitted if noise mitigation measures have been evaluated. As such, this analysis relies on these noise exposure levels to evaluate the project’s potential noise impacts.

### **Noise Sensitive Receptors**

The Calabasas General Plan Noise Element defines sensitive receptors as Residences, schools, hotels, and hospitals where excessive noise can interfere with normal activities. The nearest sensitive receptors to the Project site are single-family residences located a minimum distance of 685 feet west of the proposed solar panel installation. The route of the proposed underground conduit and wiring to connect the solar generation facility with the recycled water pump station would pass within approximately 150 feet of the nearest residence. Other sensitive uses in the vicinity of the project site include A. E. Wright Middle School located approximately 700 feet northwest of the proposed solar panel installation and 200 feet from the conduit route, as well as multi-family residences and a private preschool facility located at farther distances from the project site.

The City of Calabasas Municipal Code Section 17.20.160 limits exterior noise exposure for residences to 65 dBA, from 7:00 a.m. to 10:00 p.m. Monday through Friday (8:00 a.m. to 10:00 p.m. on weekends), with all other times having stricter limitations. This noise restriction also applies to Public Facility land uses such as schools (without the variation for weekend days).

## **Construction Noise Impacts**

Project construction would generate temporary noise events that could potentially impact sensitive uses. As the nearest sensitive use is a single-family residence located approximately 685 feet from the proposed solar panel installation, impacts will be evaluated for this residence. To comply with the City's Municipal Code Section 17.20.160 - C.4., construction activities would be restricted to the hours of 7:00 a.m. and 6:00 p.m. Mondays through Fridays, or 8:00 a.m. and 5:00 p.m. Saturdays. Construction activities would not occur on Sundays or legal holidays.

Short-term on-site construction noise impacts tend to occur in discrete phases. Construction for the proposed installation of solar panels would require only minimal finish grading, a backhoe for trenching, a vibropile rig that uses vibrations to insert poles into the ground, pneumatic hand tools for assembly, and a water truck for dust suppression. Although no soil hauling is proposed, haul trucks will be used to deliver gravel to the site.

### Construction Noise Impacts – Solar Panel Array

The project would employ a vibratory pile-driving rig to drive mounting posts into the ground. By using a vibration pile driving technique, the project would minimize the loudest construction noises associated with impact pile driving. The proposed solar panels would then be assembled onto the posts. The vibratory pile driver is a mobile piece of equipment and would move across the project site as required for each post to be installed. This equipment would not be expected to exceed noise levels of 96 dBA at 50 feet<sup>20</sup>, which would represent the highest noise levels on the site for temporary construction activities.

As point sources of noise emissions are attenuated by a factor of 6 dB per doubling of distance through geometrical (spherical) spreading of sound waves, the Project site would require at least 1,000 feet of distance to reduce construction noises of as much as 96 dBA source strength to 65 dBA, which is the City's "exterior noise level standard" threshold for residential and public facility land uses. The most westerly point of the proposed solar panel installation would be approximately 700 feet from the nearest residence. Therefore, nearby residences may be subject to temporary construction noise levels that exceed the City's standard for normal exposure. The City's Municipal Code (Section 17.20.160 - C.4.), states that Ordinance noise level standards are not applicable to "Noise sources associated with construction, including the idling of construction vehicles, provided such activities do not take place before seven a.m. or after six p.m. on any day except Saturday in which no construction is allowed before eight a.m. or after five p.m. No construction is allowed on Sunday's or federal holidays." Thus, the project's temporary noise impacts associated with construction would be less than significant given that those activities would not occur during the times restricted by ordinance.

### Mitigation Measures

Mitigation Measure Noise-1 has been provided to emphasize that the project must comply with the construction noise prohibitions as they apply to these activities. Mitigation measures Noise-2 and -3 are provided to further reduce noise impacts to sensitive receptors.

---

<sup>20</sup> Federal Transit Administration, Transit Noise and Vibration Impact Assessment (Report No. FTA-VA-90-1003-06, May 2006.

**Noise-1:**

The construction contractor shall oversee that construction activities only occur from 7:00 a.m. to 6:00 p.m., Monday through Friday, and Saturday from 8:00 a.m. to 5:00 p.m. Construction shall not be permitted on Sunday or holidays without prior consultation with the City Community Development Director.

**Noise-2:**

The construction contractor shall oversee that all mobile equipment will have properly operating and maintained mufflers.

**Noise-3:**

The construction contractor shall designate onsite areas for construction worker vehicles and for storage of equipment and materials. These areas shall be set back from the roadway and neighboring residences approximately 600 feet or otherwise shielded from the surrounding developments.

Construction Noise Impacts – Conduit and Wiring

To connect the solar panel array with the recycled water pump station, conduit and wiring would be laid underground within existing dirt roads and paved parking lots/driveways. The conduit would be placed in a trench to be dug by backhoe. A backhoe emits 80 dBA at 50 feet from the source<sup>21</sup>, and with proposed trenching activities to occur within 150 feet of an area residence, would result in an exterior exposure to noise levels between 68 and 74 dB at the nearest residence from trenching activities. Mitigation measure Noise-1 would reduce these construction related noise impacts to less than significant.

Operational Noise Impacts

The use and operation of the solar panels to generate electricity would not produce noises audible to off-site receptors. Therefore, no operational impacts would occur.

**b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?**

**Less Than Significant Impact.** Construction activities and street traffic are some of the most common external sources of vibration that can be perceptible inside residences. The effects of ground-borne vibration include discernable movement of building floors, rattling of windows, and shaking of items on shelves. These effects generally occur due to resonances in the structural components of a building, which can amplify groundborne vibration.

Groundborne vibrations from construction activities rarely reach levels that can damage structures. Since vibration is typically not an issue, very few jurisdictions have adopted vibration significance thresholds. Vibration thresholds have been adopted for major public works

---

<sup>21</sup> Federal Transit Administration, Transit Noise and Vibration Impact Assessment (Report No. FTA-VA-90-1003-06, May 2006.

construction projects, but these relate mostly to structural protection (cracking foundations or stucco) rather than to human annoyance.

Vibration is most commonly measured as the root mean square velocity of a vibrating object, which is expressed in units of vibration decibels (VdB). These vibration decibels diminish with distance from the source. For typical construction equipment, the Federal Transit Administration (FTA) has estimated vibration levels at various distances from sensitive receptors. In the absence of a City designated significance threshold for vibrations, a range of effects from various levels of vibrations are listed in **Table 5.12-1**:

**Table 5.12-1**  
**Effects of Groundborne Vibration**

Vibration Levels	Vibration Effects
65 VdB	threshold of human perception
72 VdB	annoyance due to frequent events
80 VdB	annoyance due to infrequent events
94-98 VdB	minor cosmetic damage to structures

Although not proposed for use as part of this project, the impact pile driver is listed by the FTA Transit Noise & Assessment Handbook as generating the highest vibration impacts among standard pieces of construction equipment. As the impact pile driver is assigned a vibration level of 112 VdB<sup>22</sup>, which dissipates to 75 VdB over a distance of 185 feet, and the project solar panel array would be located a minimum of 650 feet from the development footprint, vibration impacts related to project construction would be less than significant.

**c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?**

**No Impact.** The Project site would not result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project because the use and operation of the solar panels would not generate noises audible to off-site receptors. Therefore, no impacts would occur.

**d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?**

**Less Than Significant Impact with Mitigation Incorporated.** Refer to responses 5.12-a regarding construction noise and mitigation measures.

<sup>22</sup> Federal Transit Administration, Transit Noise and Vibration Impact Assessment (Report No. FTA-VA-90-1003-06, May 2006.

- e) **For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?**

**No Impact.** The project site is not located in close proximity to a public airport, and the project would not be affected by an airport land use plan. Therefore, no impacts would occur.

- f) **For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?**

**No Impact.** The project site is not located in close proximity to a private airstrip.

### 5.13 POPULATION AND HOUSING

- a) **Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes or businesses) or indirectly (for example, through extension of roads or other infrastructure)?**

**No Impact.** The project site is currently open space and implementation of the project would not introduce a facility that would require staffing, or otherwise introduce population growth into the area, either directly or indirectly.

- b) **Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?**

**No Impact.** The project site is currently open space; therefore no existing housing units would be displaced as a result of implementing the project.

- c) **Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

**No Impact.** See response 5.13 (b).

## 5.14 PUBLIC SERVICES

a) **Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:**

i) **Fire protection?**

**No Impact.** The Los Angeles County Fire Department, Calabasas Station #125 would provide fire protection and emergency medical services for the project. This station is located at 5215 Las Virgenes Road, approximately one mile north of the project site.

The entire City of Calabasas is designated as a high fire hazard zone, however the proposed project would not place habitable structures on the site that would result in additional fire protection demands. Additionally, per Los Angeles County Fire Department requirements, the project would maintain a 20-foot wide dirt access road along the site perimeter, and a 10-foot vegetation clearance buffer zone to create a defensible space for the project. The project would not result in the need for additional fire protection facilities and would have no impact on fire protection services.

ii) **Police protection?**

**No Impact.** Police protection services at the project site are provided by the Los Angeles County Sherriff's Department Lost Hills Substation. The Lost Hills Substation currently provides police services for the entire Calabasas area. Response times for this station average from about 4.7 minutes for emergency calls to about 23.6 minutes for routine calls (2030 General Plan EIR, 2008). The proposed project would not increase the population within the City and thus would not increase the number of calls received by the Sherriff's Substation. Therefore, the project would have no impact on police protection services, and no new police facilities would be required.

iii) **Schools?**

**No Impact.** The Las Virgenes Unified School District (LVUSD) provides education to students in the project area. The project site is within the service area for Calabasas High School, A.E. Wright Middle School, and Lupin Hill Elementary School.

The project would not increase population and would not generate new students that would be served by the LVUSD. Therefore, no new school facilities would be required and the project would have no impact.

**iv) Parks?**

**No Impact.** The project is located in an area of the City of Calabasas served by existing park facilities, which include:

- The Calabasas Bark Park - a one-acre park located immediately north of the project site on Las Virgenes Road. This park also serves as a trailhead for a multi-use trail network through open spaces to the east.
- Juan Bautista de Anza Park - an 8-acre park and recreational facility located 0.6 mile south of the project site at the intersection of Las Virgenes Road and Lost Hills Road. This park also serves as a trailhead for a multi-use trail network through public open space areas to the south.

The project site would also be in the vicinity of Malibu Creek State Park; a 7,000-acre regional recreational open space area located approximately two miles south of the project that provides opportunities for hiking, fishing, bird watching, and horseback riding.

The project would not increase the population or generate new park users; therefore no new parks would be required to be constructed. The project would have no impact on the provision of public parks.

**v) Other public facilities?**

**No Impact.** Refer to responses 5.14-a (i-iv) above.

## 5.15 RECREATION

- a) **Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

***No Impact.*** Refer to response 5.14-a (iv).

- b) **Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?**

***No Impact.*** Refer to response 5.14-a (iv).

## 5.16 TRANSPORTATION/TRAFFIC

- a) Would the project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

**Less Than Significant Impact with Mitigation.** The City of Calabasas 2030 General Plan (2008) Circulation Element has adopted level of service (LOS) thresholds as minimum acceptable operating standards for City intersections and roadway segments. A project's traffic impacts are determined by the amount of traffic that it would generate.

Projects that degrade roadways and/or intersections below the LOS C/D standard must provide measures to mitigate their impacts. **Table 5.16-1** presents the City's thresholds of significance criteria as listed in the City of Calabasas 2030 General Plan Transportation Element.

**Table 5.16-1**  
**City of Calabasas Traffic Impact Thresholds**

<b>Project Related Traffic Increases that Constitute a Significant Impact Where Roadway Performance Standards Are or Will Be Exceeded (Urban Areas)</b>		
<b>Existing or Future Link/Intersection LOS</b>	<b>Volume to Capacity (V/C) Ratio</b>	<b>Maximum Peak Hour V/C Increase</b>
LOS D	0.81 - 0.90	0.02
LOS E	0.91 - 1.00	0.015
LOS F	> 1.00	0.01

### Construction

The majority of construction workers and delivery trucks that would access the project site during construction would approach the site from U.S. 101 traveling south on Las Virgenes Road passing through the Las Virgenes Road/Agoura Road intersection. The Calabasas General Plan EIR reported traffic levels of 23,120 Average Daily Trips (ADT) along Las Virgenes Road south of Agoura Road (including the segment adjacent to the Project), which is beyond its acceptable design capacity. Therefore, this roadway currently operates at LOS F. It is noted that the City's General Plan EIR describes the intersection of Las Virgenes Road and Lost Hills Road as LOS F, however it is expected that the majority of construction-related trips to this site would travel between the site and U.S. 101, which would avoid this intersection.

The project's short-term increase in traffic volumes is not expected to cause a significant impact on area roads due to the scope of the construction activities. Project construction would result in a temporary increase in traffic on area roadways as construction workers and delivery trucks bringing equipment and materials access the site. The number of construction workers to be onsite site daily would vary within an estimated range of 5 to 30. The project would not result in soil import or export hauling activities, as only minor finish grading would be required. All

construction parking, equipment staging, and materials storage would be onsite and would not affect traffic flows.

To achieve a 2-inch thick gravel layer beneath the panels for dust and weed control, approximately 1,613 cy of gravel (for a 6-acre area) will be provided. This would require a total of 134 trucks (12 c,y, per truck) to deliver the gravel material. The delivery schedule for this material has not been established, however a total of 3 to 4 days would be required for the total number of trucks to access the site. This delivery schedule could be spread out across additional days if those deliveries occur while school is in session at A.E. Wright Middle School as mitigation measure Traffic-2 prohibits project materials delivery during peak hours for student drop off and pick up (7:30 am – 9:30 am and 2:30 pm – 3:30 pm).

For a conservative estimate, the analysis will assess the maximum number of 30 workers onsite assuming that each worker would use a personal vehicle. This would result a total of 60 daily trips added to the daily total, or a 0.0025 increase in traffic along this roadway. This increase would be well below an increase of 0.01, which is the level of increase that would be considered significant as seen in Table 5.16-1. The delivery schedule is not known at this time to determine an average daily amount of truck trips bringing equipment or materials to the site, however as no soil export or import hauling would occur, and material deliveries would be spread out over the twelve-month duration of construction, any increase in ADT related to delivery vehicles would not be expected to exceed the 0.01 significance threshold.

Although the effects would be temporary, implementation of Mitigation Measures Traffic-1 and Traffic-2 would ensure that appropriate traffic controls and scheduling are implemented, and that use of local roads by vehicles related to project construction is minimized.

### Operations

The project would not provide habitable structures for residents or employees, and would not be occupied in the course of daily operations, with the exception of periodic maintenance visits. Therefore, once operational, the project would not increase the daily traffic rates on area roadways and would have less than significant impacts.

As the project would only generate temporary traffic related to construction, and no long-term daily operational trips would result, cumulative impacts would be less than significant.

## **MITIGATION MEASURES**

### ***Traffic-1:***

Throughout the duration of construction activities, construction traffic shall not block emergency vehicle access along Las Virgenes Road or other area roadways. Delivery routes shall be designed to minimize use of City streets, and if feasible, scheduled to avoid peak traffic hours. The applicant shall consult with the City of Calabasas Department of Public Works Transportation/Transit Division prior to initiation of construction activities that may affect area traffic (such as delivery of equipment or materials necessitating momentary lane closures to access the site) and will implement appropriate traffic controls in accordance with the California Vehicle Code and other state and local requirements to avoid or minimize impacts on traffic.

**Traffic-2.**

Throughout the duration of construction activities, construction traffic for delivery of materials or equipment shall be prohibited along Las Virgenes Road during the hours of 7:30 am – 9:30 am and 2:30 pm – 3:30 pm while A.E. Wright Middle School is in session. This prohibition shall not be in effect during summer months when the school is not in session (June 12, 2013 through August 21, 2013).

- b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?**

***Less Than Significant Impact.*** Based on the Los Angeles County Congestion Management Program (CMP) guidelines,<sup>23</sup> intersection monitoring locations must be examined if the project would add 50 peak hour trips (A.M. or P.M. peak hours). The CMP guidelines also require that freeway monitoring locations must be examined if the project would add 150 peak hour trips or more.

As discussed in response 5.16-a, project operations would not result in any daily trips on area roadways. The periodic maintenance of the proposed facility would not result in conflicts with the CMP. During construction, a maximum number of 30 construction workers would be onsite at any one time. Assuming every worker occupies a single vehicle, the project would have a maximum addition of 30 peak hour trips. There are no identified CMP intersections in the project vicinity between the project site and the U.S. 101 freeway, thus no further review of CMP intersections is warranted. The project's construction period peak hour trips that would access the U.S. 101 freeway would not be expected to exceed the CMP threshold of 150 peak hour trips. Due to the limited number of trips that would be generated by the project, and because the project would not add any long-term daily trips to area roadways, the project would result in less than significant impacts regarding the CMP.

- c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?**

***No Impact.*** The proposed project would not have any direct impacts on air traffic, as the site is not located in proximity to a regional or private airport, and does not include development of a private airstrip or heliport.

- d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**

***Less Than Significant Impact.*** The project would not alter roadway design, or introduce a land use that would be incompatible with existing traffic patterns.

- e) Result in inadequate emergency access?**

<sup>23</sup> 20010 Draft Congestion Management Program for Los Angeles County, County of Los Angeles Metropolitan Transportation Authority, 2010.

**Less Than Significant Impact.** Access to the site would be via private gates along Las Virgenes Road and from the Bark Park parking lot. These private entryways would be available for emergency access and allow internal circulation via the existing dirt road network onsite. Impacts related to emergency access would be less than significant.

**f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?**

**No Impact.** The project would not conflict with the City transit plans including planned improvements to the Las Virgenes corridor as described in the City's Las Virgenes Road Corridor Design Plan. The planned improvements include the provision of Class II bike lanes and sidewalks along the roadway segment adjacent to the proposed project. The proposed project would be located approximately 600 feet away from the roadway and would not interfere with construction of bike lanes or sidewalks should the City proceed with such plans.

### 5.17 UTILITIES AND SERVICE SYSTEMS

- a) **Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?**

**No Impact.** The project does not propose to provide facilities that would generate wastewater or facilities that would provide such treatment. As such, the project would have no impact.

- b) **Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects?**

**Less Than Significant Impact.** The project site would not provide facilities that would generate wastewater. Onsite water use would be limited to washing of the solar panels, which is expected to occur approximately once annually. Water for this activity would be provided by LVMWD and would be delivered by truck to the site. Due to the limited amount of washing activities to occur, water supply impacts would be less than significant.

- c) **Would the project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

**No Impact.** The project would place solar panels mounted on a system of poles that would be driven into the ground, leaving the ground surface permeable as is the existing condition. Therefore, runoff water would not be expected to be increased by the project and no new drainage facilities would be required.

- d) **Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

**Less Than Significant Impact.** Refer to response 5.17-b.

- e) **Would the project result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?**

**No Impact.** Refer to response 5.17-a and -b.

- f) **Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?**

**Less Than Significant Impact.** The County of Los Angeles operates the Calabasas Landfill located approximately 2.5 miles travel distance from the project site. The City's 2030 General Plan EIR reports that Calabasas Landfill is permitted to receive 3,500 tons of solid waste per day and as of 2008 was accepting 1,555 tons per day and is estimated to be operational through 2024.

Construction of the project would result in solid waste consisting of product packaging and scrap material. Solid waste from construction activities would be separated onsite to divert recyclable materials from that to be placed in a landfill. Operations of the project would not result in solid waste generation, as no personnel would be employed on the site with the exception of periodic maintenance activities. As the project's construction would be completed in approximately 12 months, and the Calabasas landfill has adequate capacity to remain operational for the next ten years, impacts to the Calabasas Landfill would be less than significant.

**g) Would the project comply with federal, state, and local statutes and regulations related to solid waste?**

**No Impact.** The project would comply with the California Integrated Waste Management Act of 1989 (AB 939), which requires each city and county in California to prepare, adopt, and implement a Source Reduction and Recycling Element. Although the City of Calabasas has not adopted a Construction and Demolition ordinance to regulate the recycling or disposal of construction debris, the City has adopted a more general goal of diverting 75 percent of all solid waste. The project would separate recyclable materials onsite for diversion from landfill disposal to facilitate the City's compliance with AB 939 requirements. Any hazardous materials to be used on the site would be recycled, treated, and disposed of in accordance with federal, state, and local laws, and therefore no impact would result under this criterion.

## 5.18 MANDATORY FINDINGS OF SIGNIFICANCE

- a) **Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?**

***Less Than Significant Impact with Mitigation Incorporated.*** Mitigation has been incorporated into the project to reduce potentially significant impacts to biological resources on the project site to less than significant levels. Biological issues are discussed in detail in Section 5.4 and Appendix B of this document. The project would not significantly affect cultural resources, and potential effects to paleontological resources would be fully mitigated, as analyzed in Section 5.5. With implementation of the identified mitigation measures, degradation of the quality of the environment, or reduction in habitat, plant, fish or wildlife community would not occur.

- b) **Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?**

***Less Than Significant Impact.*** The proposed project, along with planned development in the area, would not result in cumulative impacts beyond those identified as project level impacts. As the project site would not generate an increase in population, or provide a facility for employees, project impacts would be limited to the construction period for many environmental issue areas such as traffic, air quality and noise. The project would result in a reduction of cumulative GHG emissions as the proposed solar generation facility would offset electricity supplies currently generated by SCE.

As revealed by the previous discussions in Section 5.0 for each of the environmental categories, impacts from the proposed project are considered to be less than significant, or would be reduced to less than significant after the incorporation of mitigation measures.

The project would incrementally contribute to cumulative impacts related to development within the City of Calabasas and the surrounding areas, however, no residually significant impacts would result with implementation of the project. In the absence of residually significant impacts, the incremental accumulation of effects would be less than significant.

- c) **Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?**

***Less than Significant Impact.*** The project would result in environmental effects, however, these effects would not cause substantial adverse effects on human beings as discussed in this MND for each issue area described above. Also, project compliance with goals and policies established in the City of Calabasas General Plan would ensure that direct or indirect effects on human beings would be less than significant.



## 6.0 RESPONSES TO COMMENTS TO DRAFT MND

Comments on the Draft IS/MND were received from the City of Calabasas and the Las Virgenes Unified School District. No other comments were received at the conclusion of the comment period on March 25, 2013. Following the comments and response section, the Draft MND has been provided as a reference, and to provide the mitigation and monitoring plan that would need to be implemented along with the new and altered mitigations provided in the below responses.

### 6.1 CITY OF CALABASAS COMMENTS

On March 6, 2013, City of Calabasas City Planner Mr. Tom Bartlett met with Mr. John Zhao of LVMWD to discuss the Draft IS/MND and the City's comments regarding the Project's impact analysis. The following responses are provided to address the comments and concerns regarding the proposed project as expressed at that meeting.

1. The City suggests revising mitigation measures related to onsite landscaping to provide adequate screening of the project without blocking ridgeline views from Las Virgenes Road. The MND mitigation measures Aes-1 and Aes-2 shall be rewritten as follows:

**Aes-1.** The applicant shall plant additional trees at the time of project construction on the slope between the upper terrace and lower terrace areas of the property to provide visual screening of the solar panels while preserving the existing ridgeline view from Las Virgenes Road. The trees planted for this mitigation shall consist of a combined mix of evergreen and deciduous varieties, and the number, size, and placement of mitigation trees for visual screening shall be determined in consultation with the City of Calabasas Director of Community Services.

**Aes-2.** The applicant shall coordinate with the City of Calabasas staff to design and implement a landscape plan that would reduce visual impacts to the Scenic Corridor.

2. The City suggests additional discussion of a wildlife corridor that includes portions of the project site. The following discussion has been added to the MND.

The project site does not contain a native wildlife nursery site.

The term wildlife movement corridor is used to describe physical connections that allow wildlife to move between patches of suitable habitat in both undisturbed landscapes as well as environments fragmented by urban development to access essential habitat for water, foraging, breeding, and cover. Wildlife movement corridors are necessary for dispersal and migration, to ensure the mixing of genes between populations, and so wildlife can respond and adapt to environmental stress. Examples of barriers or impediments to movement include housing and other urban development, roads, fencing, unsuitable habitat, or open areas with little vegetative cover. Wildlife crossings are generally small, narrow areas allowing wildlife to pass through an obstacle or barrier, such as a roadway to reach another patch of habitat. These can be critical at both the local and regional level. Wildlife

crossings include culverts, drainage pipes, underpasses, tunnels, and, more recently, crossings created specifically for wildlife movement over highways.

To assess the project's impacts on wildlife movement, the City of Calabasas General Plan, the Santa Monica Mountains National Recreation Area (SMMNRA) Land Protection Plan (National Park Service, March 1998), and the South Coast Missing Linkages Project: A Linkage Design for the Santa Monica Mountains-Sierra Madre Connection (Penrod, K., 2006) were reviewed to determine if the project site is within an area that has been identified as an important wildlife corridor or an important linkage necessary for maintaining connectivity between large areas of core natural habitat. The project site was also evaluated in conjunction with surrounding habitats for its potential importance to wildlife movement both in the field and by reviewing recent aerial photographs of the area.

The solar facility would be developed within a habitat linkage for wildlife movement, which is identified in all three of the above-mentioned documents. Within the City of Calabasas, the linkage encompasses a wide swath of habitats located to the east of Las Virgenes Road, which extend from the southern city limits near Mulholland Road to the north of the 101 Freeway. The linkage is shown on Figure IV-1, Significant Ecological Areas, Linkages, and Corridors of the City of Calabasas General Plan. The linkage identified in the City's General Plan is part of a regional habitat linkage referred to as the Santa Monica-Sierra Madre Connection, which is important for facilitating wildlife movement and maintaining habitat connectivity between the Santa Monica Mountains and inland habitats, including the Simi Hills and Sierra Madre Mountains. The Draft Los Angeles County General Plan also identifies the project site as within a regional habitat linkage. As discussed in Missing Linkages: Restoring Connectivity to the California Landscape (Penrod, K., November 2, 2000), the Santa Monica-Sierra Madre Connection habitat linkage was given a 3 out of 5 overall threat rank by participants of the Missing Linkages conference held in November 2000, which was cosponsored by the California Wilderness Coalition, Nature Conservancy, and United States Geological Survey, where 1 = no threat/secure and 5 = severe threat/loss imminent. Scores of 4 or 5 are considered severely threatened.

Although the solar facility would be developed within an important habitat linkage, development of the facility would not interfere substantially with wildlife movement or have a significant adverse effect on the value of the linkage for wildlife movement.

Wildlife would likely avoid the facility, as the ground surface of the facility would not be vegetated, and would prefer to use adjacent fields or natural areas in the vicinity of the site for movement. However, as the facility would not be fenced, the facility would not represent a barrier to movement and wildlife could pass through the array by moving between the solar panels. No artificial night lighting is proposed that could dissuade wildlife from using the surrounding area.

The loss of habitat for wildlife movement within the linkage would not be significant considering the non-native and managed condition of the project site, as well as the remaining width and area available within the linkage. As discussed, the solar array would be sited on an open, disturbed field of non-native herbs, which is routinely mowed. The field is of relatively low overall habitat value and lacks protective cover for wildlife. Where

the facility would be constructed, the linkage is approximately 0.7 miles wide. With development of the facility, an approximate 0.35-mile wide swath of native habitats within the linkage to the east of the project site would continue to provide opportunities for wildlife movement through the area. Also, wildlife could continue to pass through fields and disturbed areas to the west of the solar array and east of Las Virgenes Road.

The project would only result in the loss of low value, disturbed non-native habitat within the linkage and would not represent a barrier to movement or disrupt the overall capacity of the habitat linkage to provide opportunities for dispersal of fauna over the short or long-term. Therefore, impacts to wildlife movement are considered to be less than significant.

3. City suggests inclusion of solar panel height discussion and profile drawing with dimensions.

The project description indicates that the solar panels would be mounted on poles driven into the ground, and when tilted to their most vertical alignment (approximately 45 degrees) would extend to a maximum height of about 10 feet at the upper edges, with approximately three feet of ground clearance at the lower edges. Additionally, a project site map has been provided in Appendix C that shows the proposed alignment of the solar panel rows within the site, as well as a profile of the solar panel and support structure within Appendix D that indicate the solar panel height (approximately 8 feet and four inches above ground surface). Additionally, for enhancement of the visual impacts analysis, a cross-section has been provided that shows the comparative heights/elevations of the proposed panels, the existing upper terrace on which the project will be located, the adjacent land, Las Virgenes Road, a perimeter wall between the roadway and residences, and a representative residence that lies adjacent to the roadway (Appendix E).

4. City requests discussion of reflection of solar panels, and poles, and their impact to surrounding areas.

To provide additional background discussion of glare impacts, a glare study prepared for a solar panel installation in Imperial County has been provided as Attachment 4 to this document. Based on information provided in that study, additional discussion of glare impacts has been provided for Section 5.1d as follows:

#### Glare

Glare is defined as a harsh uncomfortably bright light, and can be either direct from a light source, or indirect from reflected light. The reflection of light from smooth surfaces such as window glass may be perceived as glare. Buildings constructed of highly reflective materials from which the sun reflects at a low angle commonly cause adverse glare.

To produce electricity from sunlight effectively, solar panels are designed to absorb light and minimize reflection in order to maximize the electricity generated, and therefore the solar panels proposed for this project would be constructed of non-glare material that would minimize reflected light and associated glare impacts.

The City's Municipal Code Section 17.20.190 provides requirements for solar panel installations related to glare impacts specifically focused on active or passive heating or cooling features. Although the proposed project does not fit the category regulated by that section of the Code, the project would comply with this ordinance to the extent that the requirements could be applied to the type of facility proposed. This Ordinance includes Section 17.20.190.A which requires that for solar systems regulated by the Code, "ground-mounted collectors shall be screened from a public right-of-way", and 17.20.190.D which states that "exterior surfaces of the collectors and related equipment shall have a non-reflective finish and shall be color-coordinated to harmonize with roof materials and other dominate colors of the structure."

As discussed above in Section 5.1 a), the project site is situated within a canyon area with ridgelines that provide substantial screening of the site from the north, east, and west. Views from the southwest are screened by roadside trees and mitigation measure Aes-1 and Aes-2 provide for additional landscaping on the site to further screen views, as required for solar systems regulated by part A of this ordinance.

In accordance with part D of this ordinance the solar panels to be installed are to be manufactured with a non-reflective coating. As a stand-alone solar generation facility, the project does not include roof materials to color-coordinate with. Therefore, with landscaping provided and solar panels that incorporate a non-reflective coating, the project would comply with Municipal Code Section 17.20.190.

#### Solar Panel Reflectivity

One method to determine an object's reflectivity is to measure the albedo, which is the ratio of solar radiation across the visible and invisible light spectrum reflected by a surface. Albedo varies between 0, a surface that reflects no light, and 1, a mirror-like surface that reflects all incoming light. To provide a comparison of the reflectivity of solar panels to the surrounding environment, solar panels with a single anti-reflective coating have a reflectivity of between .03 and .18 as a measured albedo. By comparison, sand has an albedo rating of between .15 and .45 and agricultural vegetation has an albedo of between .18 and .25. This indicates that the solar panels would not exceed the reflectivity of the area's prevailing grasses and vegetative ground cover.<sup>24</sup>

#### Reflection Analysis

The project proposes to install solar panels that tilt with the changing angle of the sun to maintain a perpendicular alignment with incoming solar rays. As the angle of reflection equals the angle of incidence (the incoming angle of light rays), direct reflections from the panels would be directed upwards, back at the sun, thereby eliminating direct reflection impacts at residences and roadways from the solar panels.

As with the potential for direct reflections, indirect reflections would not produce a significant glare effect. Indirect reflections are diffused and by definition significantly less

---

<sup>24</sup> ESA, Solar Glare Analysis of Proposed Calipatria Solar Farm I & II, March 24, 2011.

intense than a direct reflection, with a nearly 80 percent reduction in intensity by moving 30 degrees off of the direct reflection angle.<sup>25</sup>

By tracking the sun, the solar panels would be tilted in an east-southeasterly direction facing away from Las Virgenes Road and residences for a substantial portion of the day. As the panels tilt with the changing angle of the sunlight in the afternoon, the panels would be angled in a west-northwesterly facing direction. While tilted to the west, an existing ridgeline that rises to a height of between 30 to 100 feet above the project site's upper terrace would screen the majority of Las Virgenes Road and residences from reflections and associated adverse impacts, should such reflective glare emanate from the solar panels.

As seen in appendix E, the height of the proposed solar panels would be approximately 70 feet higher than the upper floors of single-family homes located on the west side of Las Virgenes Road to the south and west of the project site. This height variation, along with the alignment of the rows of panels in a northeasterly to southwesterly alignment would minimize indirect reflections from the solar panels from potentially impinging on those residences along Las Virgenes Road, or affecting drivers on the roadway.

This indicates that while at certain times of the day an observer may have a view of an indirect reflection, the relative intensity of the reflection would not cause an adverse glare or be a significant concern. Additionally, by providing onsite landscaping as described by Mitigation Measures Aes-1 and Aes-2 the project would further obscure views from off-site minimizing indirect reflection impacts.

#### Glare Impact Summation

Therefore, as the project would be constructed of non-glare materials including metal support poles to be painted per mitigation measure Aes-3, and with screening provided by intervening ridgelines, existing roadside trees, and additional onsite landscaping provided by implementation of Mitigation Measure Aes-1 and Aes-2, glare impacts to vehicle operators on Las Virgenes Road, as well as residences to the west would be less than significant.

5. City requests additional information regarding the import and export of excavation soils as well as import quantity of ground cover materials.

The JPA has provided the following additional information.

The project site is currently graded and relatively level such that no soil export is proposed. Minor spoils from site prep grading (to insure stormwater would not pond within the project area) would remain onsite within previously disturbed areas and be redistributed as needed to achieve the desired terrain profile. To achieve a 2-inch thick gravel layer beneath the panels for dust and weed control, approximately 1,613 cy of gravel (for a 6-acre area) will be provided. This would require a total of 134 trucks (12 c,y, per truck) to deliver the gravel material. The delivery schedule for this material has not been established, however a total

---

<sup>25</sup> Ibid.

of 3 to 4 days would be required for the total number of trucks to access the site. This delivery schedule could be spread out across additional days if those deliveries occur while school is in session at A.E. Wright Middle School as mitigation measure Traffic-2 (added below in Section 2.2) prohibits project materials delivery during peak hours for student drop off and pick up (7:30 am – 9:30 am and 2:30 pm – 3:30 pm).

## 6.2 LAS VIRGENES UNIFIED SCHOOL DISTRICT COMMENTS

The Las Virgenes Unified School District (LVUSD) provided a comment letter regarding the project on March 1, 2013, requesting that construction traffic be prohibited during peak traffic hours for the arrival and dismissal times for A.E. Wright Middle School. A copy of the LVUSD comment letter is attached immediately following the response.

6. At the suggestion of Karen Kimmel of the Las Virgenes Municipal School District (by letter dated March 1, 2013), due to the proximity of the project to A.E. Wright Middle School, Mitigation Measure Traffic-2 has been added. This measure would be in effect when the school is in session to reduce traffic conflicts with material delivery vehicles and vehicles accessing the school for student drop off and pick up. This mitigation measure has been provided as follows:

**Traffic-2.** Throughout the duration of construction activities, construction traffic for delivery of materials or equipment shall be prohibited along Las Virgenes Road during the hours of 7:30 am – 9:30 am and 2:30 pm – 3:30 pm while A.E. Wright Middle School is in session. This prohibition shall not be in effect during summer months when the school is not in session (June 12, 2013 through August 21, 2013).

LAS VIRGENES UNIFIED SCHOOL DISTRICT  
4111 N. LAS VIRGENES ROAD  
CALABASAS, CALIFORNIA 91302  
Telephone: (818) 880-4000  
Fax: (818) 880-4200  
www.lvusd.org



BOARD OF EDUCATION

JILL GAINES

CINDY ISER

DAVE MOORMAN

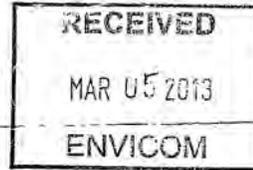
LESLI STEIN

GORDON WHITEHEAD

DANIEL STEPENOSKY, Ed.D.  
SUPERINTENDENT

March 1, 2013

Primo Tapia  
Envicom Corporation  
28328 Agoura Road  
Agoura Hills, CA 91301



Subj: Las Virgenes Municipal Water District  
Joint Powers Authority  
Solar Generation Project  
Recycled Water Pump Station

Dear Mr. Tapia:

Thank you for sending us a copy of your draft Initial Study and Mitigated Negative Declaration on the aforementioned project. Please be advised that due to the proximity of A. E. Wright Middle School to the proposed project, we would request that construction traffic be prohibited during the following hours (Monday – Friday):

- o Morning hours 7:30am – 9:30 am
- o Afternoon hours 2:30pm – 3:30pm

These represent the peak traffic hours for the arrival and dismissal times for the school.

If you have any further questions, please feel free to contact my office at (818) 878-5203.

Sincerely,

Karen Kimmel, CPA  
Assistant Superintendent  
Business Services

KK:kp

cc: John Zhao – Las Virgenes Municipal Water District

This page is intentionally blank.

---

## 7.0 PREPARERS AND REFERENCES

### PREPARERS OF THE MND

Envicom Corporation  
28328 Agoura Road  
Agoura Hills, CA 91301  
Contact: Primo Tapia III, Vice President

#### Contributing Staff:

Travis Cullen, Chief Operations Officer  
Charles Cohn, Environmental Analyst  
Jim Anderson, Staff Biologist  
Chris Boyte, Graphic Artist  
Renee Mauro, Lead Word Processor/Contracts Administrator

### REFERENCES

- American Ornithologists' Union (AOU). 1998. Check-list of North American birds. Seventh edition. American Ornithologists' Union, Washington, D.C. [as modified by subsequent supplements and corrections published in *The Auk*]. Also available online: <http://www.aou.org/>.
- Baker, R. J., L. C. Bradley, R. D. Bradley, J. W. Dragoo, M. D. Engstrom, R. S. Hoffman, C. A. Jones, F. Reid, D. W. Rice, and C. Jones. 2003. Revised checklist of North American mammals north of Mexico, 2003. *Museum of Texas Tech University Occasional Papers* 229:1-23.
- Baldwin, B. G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson manual: vascular plants of California*, second edition. University of California Press, Berkeley.
- Biogeographic Information and Observation System (BIOS), California Department of Fish and Game, data as of February 6, 2013;
- Birds of North America Online, Cornell Lab of Ornithology, data as of February 2013. <http://bna.birds.cornell.edu/bna>
- Calabasas, City of. 1993. General Plan Community Profile. May 6.
- Calabasas, City of. 1993. Oak Tree Preservation and Protection Guidelines (Revised Draft). April 29.
- Calabasas, City of. 1998. Las Virgenes Gateway Master Plan. December 2.
- Calabasas, City of. 2008. 2030 General Plan, December 2008.
- Calabasas, City of. Municipal Code Section 17.18.040, Scenic Corridor (-SC) Overlay Zone.

- 
- Calabasas, City of. Municipal Code Section 17.32, Oak trees, oak tree permit.
- California Department of Fish and Game, Vegetation Classification and Mapping Program, List of Vegetation Alliances and Associations. September 2010.  
[http://www.dfg.ca.gov/biogeodata/vegcamp/natural\\_comm\\_list.asp](http://www.dfg.ca.gov/biogeodata/vegcamp/natural_comm_list.asp)
- California Geological Survey, Seismic Hazard Zones Map for the Calabasas Quadrangle, accessed on June 18, 2012 at [http://gmw.consrv.ca.gov/shmp/html/pdf\\_maps\\_so.html](http://gmw.consrv.ca.gov/shmp/html/pdf_maps_so.html)
- California Natural Diversity Database (CNDDB) Rarefind 4 Element Occurrence Report for Calabasas and eight surrounding USGS quadrangles, California Department of Fish and Game, data as of February 6, 2013.
- California, State of. Department of Conservation, Division of Land Resource Protection. 2010. Los Angeles County Important Farmland Map.
- California, State of. Department of Transportation, California Scenic Highway Mapping System, accessed on May 7, 2010 at [http://www.dot.ca.gov/hq/LandArch/scenic\\_highways](http://www.dot.ca.gov/hq/LandArch/scenic_highways).
- CDFG and CNPS. Vegetation Classification of the Santa Monica Mountains Natural Recreation Area and Environs in Ventura and Los Angeles Counties, California, January 2006.
- CNPS Inventory of Rare and Endangered Plants, 8th ed., California Native Plant Society, data as of February 6, 2013.
- Constantine, D.G. 1998. Range extensions of ten species of bats in California. *Bull. So. Calif. Acad. Sci.* 97(2):49-75.
- Crother, B. I. (editor). 2008. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, with comments regarding confidence in our understanding. Sixth edition. Society for the Study of Amphibians and Reptiles *Herpetological Circular* 37:1-84.
- De Lisle, H., G. Cantu, J. Feldner, P. O'Connor, M. Peterson and P. Brown. 1986. The distribution and present status of the herpetofauna of the Santa Monica Mountains of Los Angeles and Ventura counties, California. *Southwestern Herpetologists Society Special Publication* No. 2.
- Evens, J. and T. Keeler-Wolf. 2006 (January). Vegetation Classification of the Santa Monica Mountains National Recreation Area and Environs in Ventura and Los Angeles Counties, California. California Department of Fish and Game and California Native Plant Society.
- Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) for Los Angeles County, California (and Incorporated Areas), Map No. 06037C1264F, September 26, 2008, accessed at <http://www.fema.gov/hazard/map/firm.shtm> on June 18, 2012.

- 
- Federal Transit Administration (FTA), Transit Noise & Vibration Assessment, May 2006.
- Garrett, K. and J. Dunn. 1981. Birds of Southern California; Status and distribution. Los Angeles Audubon Society, Los Angeles, California.
- Garrett, K., Dunn, J., and Morse, B. 2006. Birds of the Los Angeles Region. R.W. Morse Company. Olympia, WA.
- Grinnell, J., and A.H. Miller. 1944. The distribution of the birds of California. Pacific Coast Avifauna No. 27. 608 pp.
- Hall, E.R., and K.R. Kelson. 1959. The mammals of North America. Ronald Press Co., New York.
- Jennings, M.R., and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Final Report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California.
- Jepson Online Interchange: California Floristics, U.C. Berkeley, data as of February 2013. <http://ucjeps.berkeley.edu/interchange/>
- List of Special Vascular Plants, Bryophytes, and Lichens, California Department of Fish and Game, January 2013;
- Los Angeles Regional Water Quality Control Board (RWQCB), 2002 CWA Section 303(d), List of Water Quality Limited Segment, approved by USEPA July 2003, accessed at [http://www.swrcb.ca.gov/water\\_issues/programs/tmdl/303d\\_lists.shtml](http://www.swrcb.ca.gov/water_issues/programs/tmdl/303d_lists.shtml) on June 18, 2012.
- National Park Service 1998. National Park Service Santa Monica Mountains National Recreation Area Land Protection Plan, Parkwide GIS Analysis.
- Penrod, K., C. Cabanero, P. Beier, C. Luke, W. Spencer, E. Rubin, R. Sauvajot, S. Riley, and D. Kamradt. 2006. South Coast Missing Linkages Project: A Linkage Design for the Santa Monica-Sierra Madre Connection. Produced by South Coast Wildlands, Idyllwild, CA. [www.scwildlands.org](http://www.scwildlands.org), in cooperation with National Park Service, Santa Monica Mountains Conservancy, California State Parks, and The Nature Conservancy.
- Raven, P.H., H.J. Thompson, and B.A. Prigge. 1986. Flora of the Santa Monica Mountains, California. Southern California Botanists, Special Publication No. 2.
- Reid, Fiona. A Field Guide to Mammals of North America, 4th ed., Houghton Mifflin Company, New York, New York, 2006.
- Ross, Kevin. Personal communication with Envicom Corporation, February 12, 2013.

- 
- Sawyer, J.O., T. Keeler-Wolf, and J. M. Evens, A Manual of California Vegetation, 2nd ed., California Native Plant Society Press, Sacramento, California, 2009.
- Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.
- Sibley, D.A., 2003. The Sibley Field Guide to Birds of Western North America. A.A. Knopf, New York.
- South Coast Air Quality Management District, Rule 403. Fugitive Dust, as amended June 3, 2005.
- Southern California Association of Governments (SCAG), 2008 Regional Comprehensive Plan (RCP).
- Special Animals, California Department of Fish and Game, January 2011.
- Stebbins, Robert C. (Robert Cyril). A Field Guide to Western Reptiles and Amphibians, 3rd ed., Houghton Mifflin Company, New York, New York, 2003.
- U.S. Fish and Wildlife Service, FWS Critical Habitat Mapper for Threatened and Endangered Species, U.S. Fish and Wildlife Service, data as of May 11, 2012.
- Wasner, A. 2006. Soil Survey of Santa Monica Mountains Natural Recreation Area, California. Natural Resources Conservation Service.
- Williams, D.F. 1986 (June). Mammalian Species of Special Concern in California. Calif. Dept. Fish and Game Wildlife Management Division Admin. Rept. 86-1.
- Zeiner, D.C, W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1988 (May). California's Wildlife. Vol. I Amphibians and Reptiles. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento, Calif.
- Zeiner, D.C, W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1990a (April). California's Wildlife. Vol. III Mammals. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento, Calif.
- Zeiner, D.C, W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1990b (November). California's Wildlife. Vol. II Birds. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento, Calif.

**APPENDIX A**  
**AIR QUALITY AND GREENHOUSE GAS**  
**EMISSIONS MODELING REPORT**  
**(CalEEMod)**

This page is intentionally blank.

## Solar Panal Installation South Coast Air Basin, Summer

### 1.0 Project Characteristics

---

#### 1.1 Land Usage

Land Uses	Size	Metric
User Defined Industrial	7	User Defined Unit

#### 1.2 Other Project Characteristics

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Utility Company</b>	Southern California Edison
<b>Climate Zone</b>	9	<b>Precipitation Freq (Days)</b>	31		

#### 1.3 User Entered Comments

Project Characteristics -  
 Land Use - 7 acre solar install site  
 Construction Phase - 2 weeks grading, 6 months construction  
 Off-road Equipment - Grading: 1 dozer, 3 loader/backhoes  
 Off-road Equipment - Construction: 1 forklift, 2 loader/backhoes, 1 bore rig, 1 water truck  
 Construction Off-road Equipment Mitigation -

### 2.0 Emissions Summary

---

## 2.1 Overall Construction (Maximum Daily Emission)

### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2014	2.93	21.29	21.11	0.05	7.21	1.12	8.33	3.31	1.12	4.43	0.00	4,834.96	0.00	0.25	0.00	4,840.20
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

### Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2014	2.93	21.29	21.11	0.05	2.89	1.12	4.01	1.29	1.12	2.41	0.00	4,834.96	0.00	0.25	0.00	4,840.20
Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

## 2.2 Overall Operational

### Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	7.96	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
<b>Total</b>	<b>7.96</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	7.96	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
<b>Total</b>	<b>7.96</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 3.0 Construction Detail

### 3.1 Mitigation Measures Construction

Water Exposed Area

### 3.2 Grading - 2014

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.08	0.00	7.08	3.31	0.00	3.31						0.00
Off-Road	2.68	20.70	12.85	0.02		1.11	1.11		1.11	1.11		2,267.64		0.24		2,272.68
<b>Total</b>	<b>2.68</b>	<b>20.70</b>	<b>12.85</b>	<b>0.02</b>	<b>7.08</b>	<b>1.11</b>	<b>8.19</b>	<b>3.31</b>	<b>1.11</b>	<b>4.42</b>		<b>2,267.64</b>		<b>0.24</b>		<b>2,272.68</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Worker	0.05	0.05	0.59	0.00	0.13	0.00	0.13	0.00	0.00	0.01		105.40		0.01		105.52
<b>Total</b>	<b>0.05</b>	<b>0.05</b>	<b>0.59</b>	<b>0.00</b>	<b>0.13</b>	<b>0.00</b>	<b>0.13</b>	<b>0.00</b>	<b>0.00</b>	<b>0.01</b>		<b>105.40</b>		<b>0.01</b>		<b>105.52</b>

### 3.2 Grading - 2014

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Fugitive Dust					2.76	0.00	2.76	1.29	0.00	1.29							0.00
Off-Road	2.68	20.70	12.85	0.02		1.11	1.11		1.11	1.11	0.00	2,267.64		0.24			2,272.68
<b>Total</b>	<b>2.68</b>	<b>20.70</b>	<b>12.85</b>	<b>0.02</b>	<b>2.76</b>	<b>1.11</b>	<b>3.87</b>	<b>1.29</b>	<b>1.11</b>	<b>2.40</b>	<b>0.00</b>	<b>2,267.64</b>		<b>0.24</b>			<b>2,272.68</b>

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00			0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00			0.00
Worker	0.05	0.05	0.59	0.00	0.13	0.00	0.13	0.00	0.00	0.01		105.40		0.01			105.52
<b>Total</b>	<b>0.05</b>	<b>0.05</b>	<b>0.59</b>	<b>0.00</b>	<b>0.13</b>	<b>0.00</b>	<b>0.13</b>	<b>0.00</b>	<b>0.00</b>	<b>0.01</b>		<b>105.40</b>		<b>0.01</b>			<b>105.52</b>

### 3.3 Building Construction - 2014

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.59	13.21	8.98	0.02		0.69	0.69		0.69	0.69		2,124.12		0.14		2,127.09
<b>Total</b>	<b>1.59</b>	<b>13.21</b>	<b>8.98</b>	<b>0.02</b>		<b>0.69</b>	<b>0.69</b>		<b>0.69</b>	<b>0.69</b>		<b>2,124.12</b>		<b>0.14</b>		<b>2,127.09</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.68	7.44	4.52	0.01	0.46	0.26	0.72	0.01	0.23	0.25		1,361.71		0.03		1,362.41
Worker	0.66	0.64	7.60	0.01	1.67	0.06	1.73	0.02	0.05	0.08		1,349.13		0.07		1,350.70
<b>Total</b>	<b>1.34</b>	<b>8.08</b>	<b>12.12</b>	<b>0.02</b>	<b>2.13</b>	<b>0.32</b>	<b>2.45</b>	<b>0.03</b>	<b>0.28</b>	<b>0.33</b>		<b>2,710.84</b>		<b>0.10</b>		<b>2,713.11</b>

### 3.3 Building Construction - 2014

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.59	13.21	8.98	0.02		0.69	0.69		0.69	0.69	0.00	2,124.12		0.14		2,127.09
<b>Total</b>	<b>1.59</b>	<b>13.21</b>	<b>8.98</b>	<b>0.02</b>		<b>0.69</b>	<b>0.69</b>		<b>0.69</b>	<b>0.69</b>	<b>0.00</b>	<b>2,124.12</b>		<b>0.14</b>		<b>2,127.09</b>

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.68	7.44	4.52	0.01	0.46	0.26	0.72	0.01	0.23	0.25		1,361.71		0.03		1,362.41
Worker	0.66	0.64	7.60	0.01	1.67	0.06	1.73	0.02	0.05	0.08		1,349.13		0.07		1,350.70
<b>Total</b>	<b>1.34</b>	<b>8.08</b>	<b>12.12</b>	<b>0.02</b>	<b>2.13</b>	<b>0.32</b>	<b>2.45</b>	<b>0.03</b>	<b>0.28</b>	<b>0.33</b>		<b>2,710.84</b>		<b>0.10</b>		<b>2,713.11</b>

### 4.0 Mobile Detail

---

#### 4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Unmitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
<b>Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

#### 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		

#### 4.3 Trip Type Information

Land Use	Miles			Trip %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00

### 5.0 Energy Detail

---

#### 5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
<b>Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

## 5.2 Energy by Land Use - NaturalGas

### Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
<b>Total</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 5.2 Energy by Land Use - NaturalGas

### Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
<b>Total</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 6.0 Area Detail

---

### 6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.96	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Unmitigated	7.96	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
<b>Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

## 6.2 Area by SubCategory

### Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.93					0.00	0.00		0.00	0.00						0.00
Consumer Products	6.03					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
<b>Total</b>	<b>7.96</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>		<b>0.00</b>		<b>0.00</b>

### Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.93					0.00	0.00		0.00	0.00						0.00
Consumer Products	6.03					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
<b>Total</b>	<b>7.96</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>		<b>0.00</b>		<b>0.00</b>

## 7.0 Water Detail

---

**7.1 Mitigation Measures Water**

**8.0 Waste Detail**

---

**8.1 Mitigation Measures Waste**

**9.0 Vegetation**

---

## Solar Panal Installation South Coast Air Basin, Annual

### 1.0 Project Characteristics

---

#### 1.1 Land Usage

Land Uses	Size	Metric
User Defined Industrial	7	User Defined Unit

#### 1.2 Other Project Characteristics

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Utility Company</b>	Southern California Edison
<b>Climate Zone</b>	9	<b>Precipitation Freq (Days)</b>	31		

#### 1.3 User Entered Comments

- Project Characteristics -
- Land Use - 7 acre solar install site
- Construction Phase - 2 weeks grading, 6 months construction
- Off-road Equipment - Grading: 1 dozer, 3 loader/backhoes
- Off-road Equipment - Construction: 1 forklift, 2 loader/backhoes, 1 bore rig, 1 water truck
- Construction Off-road Equipment Mitigation -

### 2.0 Emissions Summary

---

## 2.1 Overall Construction

### Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.19	1.38	1.34	0.00	0.15	0.07	0.22	0.02	0.06	0.08	0.00	269.35	269.35	0.01	0.00	269.66
<b>Total</b>	<b>0.19</b>	<b>1.38</b>	<b>1.34</b>	<b>0.00</b>	<b>0.15</b>	<b>0.07</b>	<b>0.22</b>	<b>0.02</b>	<b>0.06</b>	<b>0.08</b>	<b>0.00</b>	<b>269.35</b>	<b>269.35</b>	<b>0.01</b>	<b>0.00</b>	<b>269.66</b>

### Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	0.19	1.38	1.34	0.00	0.13	0.07	0.20	0.01	0.06	0.07	0.00	269.35	269.35	0.01	0.00	269.66
<b>Total</b>	<b>0.19</b>	<b>1.38</b>	<b>1.34</b>	<b>0.00</b>	<b>0.13</b>	<b>0.07</b>	<b>0.20</b>	<b>0.01</b>	<b>0.06</b>	<b>0.07</b>	<b>0.00</b>	<b>269.35</b>	<b>269.35</b>	<b>0.01</b>	<b>0.00</b>	<b>269.66</b>

## 2.2 Overall Operational

### Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.45	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>1.45</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 2.2 Overall Operational

### Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.45	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>1.45</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 3.0 Construction Detail

---

### 3.1 Mitigation Measures Construction

Water Exposed Area

### 3.2 Grading - 2014

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.04	0.00	0.04	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.01	0.10	0.06	0.00		0.01	0.01		0.01	0.01	0.00	10.28	10.28	0.00	0.00	10.31
<b>Total</b>	<b>0.01</b>	<b>0.10</b>	<b>0.06</b>	<b>0.00</b>	<b>0.04</b>	<b>0.01</b>	<b>0.05</b>	<b>0.02</b>	<b>0.01</b>	<b>0.03</b>	<b>0.00</b>	<b>10.28</b>	<b>10.28</b>	<b>0.00</b>	<b>0.00</b>	<b>10.31</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.45	0.00	0.00	0.45
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.45</b>	<b>0.45</b>	<b>0.00</b>	<b>0.00</b>	<b>0.45</b>

### 3.2 Grading - 2014

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.01	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.01	0.10	0.06	0.00		0.01	0.01		0.01	0.01	0.00	10.28	10.28	0.00	0.00	10.31
<b>Total</b>	<b>0.01</b>	<b>0.10</b>	<b>0.06</b>	<b>0.00</b>	<b>0.01</b>	<b>0.01</b>	<b>0.02</b>	<b>0.01</b>	<b>0.01</b>	<b>0.02</b>	<b>0.00</b>	<b>10.28</b>	<b>10.28</b>	<b>0.00</b>	<b>0.00</b>	<b>10.31</b>

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.45	0.00	0.00	0.45
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.45</b>	<b>0.45</b>	<b>0.00</b>	<b>0.00</b>	<b>0.45</b>

### 3.3 Building Construction - 2014

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.10	0.79	0.54	0.00		0.04	0.04		0.04	0.04	0.00	115.59	115.59	0.01	0.00	115.75
<b>Total</b>	<b>0.10</b>	<b>0.79</b>	<b>0.54</b>	<b>0.00</b>		<b>0.04</b>	<b>0.04</b>		<b>0.04</b>	<b>0.04</b>	<b>0.00</b>	<b>115.59</b>	<b>115.59</b>	<b>0.01</b>	<b>0.00</b>	<b>115.75</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.04	0.44	0.30	0.00	0.03	0.02	0.04	0.00	0.01	0.01	0.00	73.88	73.88	0.00	0.00	73.92
Worker	0.04	0.04	0.44	0.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	69.15	69.15	0.00	0.00	69.23
<b>Total</b>	<b>0.08</b>	<b>0.48</b>	<b>0.74</b>	<b>0.00</b>	<b>0.12</b>	<b>0.02</b>	<b>0.13</b>	<b>0.00</b>	<b>0.01</b>	<b>0.01</b>	<b>0.00</b>	<b>143.03</b>	<b>143.03</b>	<b>0.00</b>	<b>0.00</b>	<b>143.15</b>

### 3.3 Building Construction - 2014

#### Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.10	0.79	0.54	0.00		0.04	0.04		0.04	0.04	0.00	115.59	115.59	0.01	0.00	115.75
<b>Total</b>	<b>0.10</b>	<b>0.79</b>	<b>0.54</b>	<b>0.00</b>		<b>0.04</b>	<b>0.04</b>		<b>0.04</b>	<b>0.04</b>	<b>0.00</b>	<b>115.59</b>	<b>115.59</b>	<b>0.01</b>	<b>0.00</b>	<b>115.75</b>

#### Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.04	0.44	0.30	0.00	0.03	0.02	0.04	0.00	0.01	0.01	0.00	73.88	73.88	0.00	0.00	73.92
Worker	0.04	0.04	0.44	0.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	69.15	69.15	0.00	0.00	69.23
<b>Total</b>	<b>0.08</b>	<b>0.48</b>	<b>0.74</b>	<b>0.00</b>	<b>0.12</b>	<b>0.02</b>	<b>0.13</b>	<b>0.00</b>	<b>0.01</b>	<b>0.01</b>	<b>0.00</b>	<b>143.03</b>	<b>143.03</b>	<b>0.00</b>	<b>0.00</b>	<b>143.15</b>

### 4.0 Mobile Detail

---

#### 4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Mitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

#### 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		

#### 4.3 Trip Type Information

Land Use	Miles			Trip %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00

### 5.0 Energy Detail

---

#### 5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

## 5.2 Energy by Land Use - NaturalGas

### Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### 5.2 Energy by Land Use - NaturalGas

**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
User Defined Industrial	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### 5.3 Energy by Land Use - Electricity

**Unmitigated**

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
User Defined Industrial	0					0.00	0.00	0.00	0.00
<b>Total</b>						<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### 5.3 Energy by Land Use - Electricity

#### Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
User Defined Industrial	0					0.00	0.00	0.00	0.00
<b>Total</b>						<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### 6.0 Area Detail

---

#### 6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.45	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	1.45	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

## 6.2 Area by SubCategory

### Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	tons/yr										MT/yr						
Architectural Coating	0.35					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	1.10					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>1.45</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e	
SubCategory	tons/yr										MT/yr						
Architectural Coating	0.35					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	1.10					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>1.45</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 7.0 Water Detail

## 7.1 Mitigation Measures Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
<b>Total</b>	<b>NA</b>							

## 7.2 Water by Land Use

### Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
User Defined Industrial	0 / 0					0.00	0.00	0.00	0.00
<b>Total</b>						<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 7.2 Water by Land Use

### Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
User Defined Industrial	0 / 0					0.00	0.00	0.00	0.00
<b>Total</b>						<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 8.0 Waste Detail

---

### 8.1 Mitigation Measures Waste

#### Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
<b>Total</b>	<b>NA</b>							

## 8.2 Waste by Land Use

### Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
User Defined Industrial	0					0.00	0.00	0.00	0.00
<b>Total</b>						<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

### Mitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
User Defined Industrial	0					0.00	0.00	0.00	0.00
<b>Total</b>						<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

## 9.0 Vegetation

---

**APPENDIX B**  
**BIOLOGICAL RESOURCES**

This page is intentionally blank.

**Appendix B-1**  
**Vascular Plants Species Observed**  
**February 6 & 7, 2013**

\* indicates a non-native or introduced species

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>GROUP</b>	<b>Common Name</b>
<b>Family</b>	
<i>Scientific Name</i>	
<b>CONIFERS</b>	
* <i>Pinus</i> sp.	pine
<b>FLOWERING PLANTS-DICOTS</b>	
Apocynaceae	
<i>Asclepias fascicularis</i>	narrow-leaf milkweed
Asteraceae	
<i>Artemisia californica</i>	California sagebrush
<i>Baccharis pilularis</i>	coyote brush
* <i>Carduus pycnocephalus</i>	Italian thistle
* <i>Centaurea melitensis</i>	toçalote
* <i>Cirsium vulgare</i>	bull thistle
<i>Corethrogyne filaginifolia</i>	California-aster
<i>Deinandra fasciculata</i>	fascicled tarweed
<i>Erigeron canadensis</i>	Canadian horseweed
<i>Hazardia squarrosa</i>	sawtooth goldenbush
<i>Helianthus annuus</i>	common sunflower
* <i>Helminthotheca echioides</i>	bristly ox-tongue
<i>Heterotheca grandiflora</i>	telegraph weed
<i>Isocoma menziesii</i>	coastal goldenbush
* <i>Silybum marianum</i>	milk thistle
* <i>Sonchus asper</i>	prickly sow-thistle
<i>Stephanomeria</i> sp.	wand-chicory
Brassicaceae	
* <i>Brassica nigra</i>	black mustard
* <i>Capsella bursa-pastoris</i>	shepherd's purse
* <i>Hirschfeldia incana</i>	hoary mustard
* <i>Sisymbrium irio</i>	London rocket
Chenopodiaceae	
* <i>Salsola tragus</i>	Russian-thistle
Euphorbiaceae	
<i>Croton setiger</i>	turkey-mullein
Fabaceae	
<i>Acmispon glaber</i>	deerweed
* <i>Medicago polymorpha</i>	bur-clover
* <i>Robinia pseudoacacia</i>	black locust
Fagaceae	
<i>Quercus agrifolia</i>	coast live oak
<i>Quercus lobata</i>	valley oak
Geraniaceae	
* <i>Erodium cicutarium</i>	red-stem filaree
Lamiaceae	
* <i>Marrubium vulgare</i>	horehound
<i>Salvia leucophylla</i>	purple sage
Malvaceae	
* <i>Malva parviflora</i>	cheeseweed

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>GROUP</b>	
<b>Family</b>	<b>Common Name</b>
<i>Scientific Name</i>	
Myrsinaceae	
* <i>Anagallis arvensis</i>	scarlet pimpernel
Myrtaceae	
* <i>Eucalyptus camaldulensis</i>	red gum
* <i>Eucalyptus polyanthemos</i>	silver dollar gum
Polygonaceae	
* <i>Rumex crispus</i>	curly dock
Urticaceae	
* <i>Urtica urens</i>	dwarf nettle
<b>FLOWERING PLANTS-MONOCOTS</b>	
Poaceae	
* <i>Avena barbara</i>	slender oat
* <i>Bromus diandrus</i>	ripgut grass
* <i>Bromus hordeaceus</i>	soft-chess
* <i>Bromus madritensis ssp. rubens</i>	red brome
* <i>Festuca myuros</i>	rattail fescue
* <i>Hordeum murinum</i>	foxtail barley

**Appendix B-2**  
**Potential for Occurrence of**  
**Special-Status Vascular Plant Species**

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Form</b>	<b>Blooming Period</b>	<b>Primary Habitat Associations</b>	<b>Status (Federal/State/ CNPS)</b>	<b>Potential to Occur (high, moderate, low, none)</b>
Agoura Hills dudleya ( <i>Dudleya cymosa</i> ssp. <i>agourensis</i> )	perennial herb	May - June	Rocky, volcanic breccia in chaparral and cismontane woodland at elevations between 200 to 500 meters.	FT/1B.2	No potential to occur. Suitable habitats are absent.
Beach spectaclepod ( <i>Dithyrea maritima</i> )	perennial rhizomatous herb	March - May	Coastal dune and sandy coastal scrub habitats at elevations between 3 and 50 meters.	CT/1B.1	No potential to occur. Suitable habitats are absent.
Blochman's dudleya ( <i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i> )	perennial herb	April - June	Open, rocky slopes; often in shallow clays over serpentine or in rocky areas with little soil; coastal bluff scrub, chaparral, coastal scrub, and valley and foothill grassland at elevations between 5 an 450 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Braunton's milkvetch ( <i>Astragalus brauntonii</i> )	perennial herb	January – August	Recent burns or disturbed areas, usually sandstone with carbonate layers in closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland at elevations between 4 and 640 meters. A soil specialist in saline, somewhat alkaline soils high in calcium, manganese, with some potassium.	FE/1B.1	No potential to occur. Suitable habitats are absent.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Form</b>	<b>Blooming Period</b>	<b>Primary Habitat Associations</b>	<b>Status (Federal/State/ CNPS)</b>	<b>Potential to Occur (high, moderate, low, none)</b>
California orcutt grass ( <i>Orcuttia californica</i> )	annual herb	April – August	Vernal pools at elevations between 15 and 660 meters.	FE/CE/1B.1	No potential to occur. Suitable habitats are absent.
Chaparral nolina ( <i>Nolina cismontana</i> )	perennial evergreen shrub	May – July	Sandstone or gabbro substrates in chaparral and coastal scrub at elevations between 140 and 1275 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Chaparral ragwort ( <i>Senecio aphanactis</i> )	annual herb	January – April	Chaparral, cismontane woodland, and coastal scrub habitats at elevations between 15 and 800 meters, sometimes on alkaline soils.	2.2	No potential to occur. Suitable habitats are absent.
Coastal dunes milk-vetch ( <i>Astragalus tener</i> var. <i>titi</i> )	annual herb	March – May	Coastal bluff scrub, coastal dunes, and coastal prairie habitats at elevations between 1 and 50 meters, often in vernal mesic areas.	FE/CE/1B.1	No potential to occur. Suitable habitats are absent.
Conejo buckwheat ( <i>Eriogonum crocatum</i> )	perennial herb	April - July	Conejo volcanic outcrops in rocky chaparral, coastal scrub, and valley and foothill grassland habitats at elevations between 50 and 580 meters.	CR/1B.2	No potential to occur. Suitable habitats are absent.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Form</b>	<b>Blooming Period</b>	<b>Primary Habitat Associations</b>	<b>Status (Federal/State/ CNPS)</b>	<b>Potential to Occur (high, moderate, low, none)</b>
Conejo dudleya ( <i>Dudleya parva</i> )	perennial herb	May - June	Rocky or gravelly areas on clay or volcanic substrates in coastal scrub and valley and foothill grassland habitats at elevations between 60 and 450 meters.	FT/1B.2	No potential to occur. Suitable habitats are absent.
Coulter's goldfields ( <i>Lasthenia glabrata</i> ssp. <i>coulteri</i> )	annual herb	February - June	Found in coastal salt marshes and swamps, playas, and vernal pools at elevations between 1 and 1220 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Coulter's saltbush ( <i>Atriplex coulteri</i> )	perennial herb	March – October	Alkaline or clay soils in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland habitats at elevations between 3 and 460 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Dune larkspur ( <i>Delphinium parryi</i> ssp. <i>blochmaniae</i> )	perennial herb	April – May	Maritime chaparral and coastal dunes at elevations between 0 and 200 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Estuary sea-blite ( <i>Suaeda esteroa</i> )	Perennial herb	May – January	Coastal salt marshes and swamps at elevations between 0 and 5 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Lyon's pentachaeta ( <i>Pentachaeta lyonii</i> )	annual herb	March – August	Rocky, clay substrates in coastal scrub, valley and foothill grassland, and openings in chaparral at elevations between 30 and 630 meters.	FE/CE/1B.1	No potential to occur. Suitable habitats are absent.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Form</b>	<b>Blooming Period</b>	<b>Primary Habitat Associations</b>	<b>Status (Federal/State/ CNPS)</b>	<b>Potential to Occur (high, moderate, low, none)</b>
Malibu baccharis ( <i>Baccharis malibuensis</i> )	perennial deciduous shrub	August	Chaparral, cismontane woodland, coastal scrub, and riparian woodland at elevations between 150 and 305 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Many-stemmed dudleya ( <i>Dudleya multicaulis</i> )	perennial herb	April – July	Chaparral, coastal scrub, and valley and foothill grassland at elevations between 15 and 790 meters, in heavy, often clayey soils or grassy slopes.	1B.2	No potential to occur. Suitable habitats are absent.
Marcuscent dudleya ( <i>Dudleya cymosa</i> ssp. <i>marcescens</i> )	perennial herb	April – July	On sheer rock surfaces and rocky volcanic cliffs in chaparral at elevations between 150 and 520 meters.	FT/CR/1B.2	No potential to occur. Suitable habitats are absent.
Ojai navarretia ( <i>Navarretia ojaiensis</i> )	annual herb	May – July	Valley and foothill grassland and openings in chaparral and coastal scrub at elevations between 275 and 620 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Parish's brittle scale ( <i>Atriplex parishii</i> )	annual herb	June - October	Alkali meadows, vernal pools, chenopod scrub and playas usually on drying alkali flats with fine soils at elevations between 4 and 140 meters.	1B.1	No potential to occur. Suitable habitats are absent.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Form</b>	<b>Blooming Period</b>	<b>Primary Habitat Associations</b>	<b>Status (Federal/State/ CNPS)</b>	<b>Potential to Occur (high, moderate, low, none)</b>
Parry's spineflower ( <i>Chorizanthe parryi</i> var. <i>parryi</i> )	annual herb	April – June	Sandy or rocky openings in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland at elevations between 40 and 1705 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Plummer's mariposa lily ( <i>Calochortus plummerae</i> )	perennial bulbiferous herb	May – July	Occurs on rocky or sandy sites, usually of granitic or alluvial material in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland at elevations between 100 and 1700 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Round-leaved filaree ( <i>California macrophylla</i> )	annual herb	March – May	Cismontane woodland and valley and foothill grassland on clay soils at elevations between 15 and 1200 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Salt spring checkerbloom ( <i>Sidalcea neomexicana</i> )	perennial herb	March - June	Alkali springs and marshes in chaparral, coastal scrub, lower montane coniferous forest, playas, and Mojavean desert scrub at elevations between 15 and 1530 meters.	2.2	No potential to occur. Suitable habitats are absent.
Salt-marsh bird's beak ( <i>Chloropyron maritimum</i> spp. <i>maritimum</i> )	annual herb (hemiparasitic)	May – October	Coastal dunes and coastal salt marshes and swamps at elevations between 0 and 30 meters.	FE/CE/1B.2	No potential to occur. Suitable habitats are absent.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Form</b>	<b>Blooming Period</b>	<b>Primary Habitat Associations</b>	<b>Status (Federal/State/ CNPS)</b>	<b>Potential to Occur (high, moderate, low, none)</b>
San Fernando Valley spineflower ( <i>Chorizanthe parryi</i> var. <i>fernandina</i> )	annual herb	April - July	Sandy soils in coastal scrub and valley and foothill grassland at elevations between 3 and 1035 meters.	FC/CE/1B.1	No potential to occur. Suitable habitats are absent.
Santa Monica dudleya ( <i>Dudleya cymosa</i> ssp. <i>ovatifolia</i> )	perennial herb	March – June	Volcanic or sedimentary, rocky substrates in chaparral and coastal scrub at elevations between 150 and 1675 meters.	FT/1B.2	No potential to occur. Suitable habitats are absent.
Santa Susana tarplant ( <i>Deinandra minthornii</i> )	perennial deciduous shrub	July - November	Rocky sandstone habitats in chaparral and coastal scrub at elevations between 280 and 760 meters.	CR/1B.2	No potential to occur. Suitable habitats are absent.
Slender mariposa-lily ( <i>Calochortus clavatus</i> var. <i>gracilis</i> )	perennial bulbiferous herb	March - June	Shaded foothill canyons in chaparral, coastal scrub, and valley and foothill grassland at elevations between 320 and 1000 meters.	1B.2	No potential to occur. Suitable habitats are absent.
Slender-horned spineflower ( <i>Dodecahema leptoceras</i> )	annual herb	April – June	Flood deposited terraces and washes in chaparral, cismontane woodland, and coastal scrub (alluvial fan sage scrub) at elevations between 200 and 760 meters.	FE/CE/1B.1	No potential to occur. Suitable habitats are absent.
Sonoran maiden fern ( <i>Thelypteris puberula</i> var. <i>sonorensis</i> )	perennial rhizomatous herb	January – September	Meadows and seeps along streams and seepage areas at elevations between 50 and 610 meters.	2.2	No potential to occur. Suitable habitats are absent.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Form</b>	<b>Blooming Period</b>	<b>Primary Habitat Associations</b>	<b>Status (Federal/State/ CNPS)</b>	<b>Potential to Occur (high, moderate, low, none)</b>
Southern tarplant ( <i>Centromadia parryi</i> ssp. <i>australis</i> )	annual herb	May - November	Margins of marshes and swamps, vernal mesic valley and foothill grassland, and sometimes on vernal pools at elevations between 0 and 425 meters.	1B.1	No potential to occur. Suitable habitats are absent.
Ventura Marsh milk-vetch ( <i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i> )	perennial herb	June - October	Coastal dunes, coastal scrub, and edges of brackish or coastal salt marshes and swamps at elevations between 1 and 35 meters.	FE/CE/1B.1	No potential to occur. Suitable habitats are absent.
Verity's dudleya ( <i>Dudleya verityi</i> )	perennial herb	May – June	Volcanic, rocky substrates in chaparral, cismontane woodland, and coastal scrub at elevations between 60 and 120 meters.	FT/1B.1	No potential to occur. Suitable habitats are absent.

**Federally Protected Species**

FE (Federal Endangered): A species that is in danger of extinction throughout all or a significant portion of its range.

FT (Federal Threatened): A species that is likely to become endangered in the foreseeable future.

FC (Federal Candidate): A species for which USFWS has sufficient information on its biological status and threats to propose it as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

**State Protected Species**

CE (California Endangered): A native species or subspecies which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

CT (California Threatened): A native species or subspecies that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as "rare" on or before January 1, 1985, is a "threatened species."

CR (California Rare): A species, subspecies, or variety of plant is rare under the Native Plant Protection Act when, although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens. Animals are no longer listed as rare; all animals listed as rare before 1985 have been listed as threatened.

**California Native Plant Society (CNPS) Rare Plant Rank**

CNPS List 1A: Plants presumed extinct in California

CNPS List 1B: Plants Rare, Threatened, or Endangered in California and elsewhere.

CNPS List 2: Plants Rare, Threatened, or Endangered in California but more common elsewhere.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Form</b>	<b>Blooming Period</b>	<b>Primary Habitat Associations</b>	<b>Status (Federal/State/ CNPS)</b>	<b>Potential to Occur</b> (high, moderate, low, none)
<p>CNPS List 3: A review list for plants for which there is inadequate information to assign them to one of the other lists or to reject them.</p> <p>CNPS List 4: A watch list for plants that are of limited distribution in California.</p> <p><u>CNPS Threat Rank</u></p> <p>The CNPS Threat Rank is an extension added onto the California Rare Plant Rank and designates the level of endangerment, as follow:</p> <ul style="list-style-type: none"> <li>• 0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)</li> <li>• 0.2-Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)</li> <li>• 0.3-Not very threatened in California (&lt;20% of occurrences threatened / low degree and immediacy of threat or no current threats known)</li> </ul>					

**Appendix B-3**  
**Vertebrate Wildlife Species Observed\***  
**February 6 & 7, 2013**

\* by direct observation, sign, or vocalization  
at or in the vicinity of the project site

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

Common Name	<i>Scientific Name</i>
<b>REPTILES</b>	
Great Basin fence lizard	<i>Sceloporus occidentalis</i>
<b>BIRDS</b>	
acorn woodpecker	<i>Melanerpes formicivorus</i>
American crow	<i>Corvus brachyrhynchos</i>
American meadowlark	<i>Sturnella neglecta</i>
Anna's hummingbird	<i>Calypte anna</i>
Bewick's wren	<i>Thryomanes bewickii</i>
black phoebe	<i>Sayornis nigricans</i>
bushtit	<i>Psaltriparus minimus</i>
California thrasher	<i>Toxostoma redivivum</i>
California towhee	<i>Pipilo crissalis</i>
common raven	<i>Corvus corax</i>
Cooper's hawk	<i>Accipiter cooperii</i>
dark-eyed junco	<i>Junco hyemalis</i>
house finch	<i>Carpodacus mexicanus</i>
lesser goldfinch	<i>Carduelis psaltria</i>
northern mockingbird	<i>Mimus polyglottos</i>
oak titmouse	<i>Baeolophus inornatus</i>
red-breasted sapsucker	<i>Sphyrapicus nuchalis</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
rock dove	<i>Columba livia</i>
Say's phoebe	<i>Sayornis saya</i>
sharp-shinned hawk	<i>Accipiter striatus</i>
song sparrow	<i>Melospiza melodia</i>
spotted towhee	<i>Pipilo maculatus</i>
western scrub jay	<i>Aphelocoma californica</i>
white-crowned sparrow	<i>Zonotrichia leucophrys</i>
white-tailed kite	<i>Elanus leucurus</i>
wrentit	<i>Chamaea fasciata</i>
yellow-rumped warbler	<i>Dendroica coronata</i>
<b>MAMMALS</b>	
Botta's pocket gopher	<i>Thomomys bottae</i>
California ground squirrel	<i>Spermophilus beecheyi</i>
coyote	<i>Canis latrans ochropus</i>
desert cottontail	<i>Sylvilagus audubonii sanctidiegi</i>
mule deer	<i>Odocoileus hemionus</i>

**Appendix B-4**  
**Potential for Occurrence of**  
**Special-Status Wildlife Species**

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Status Federal/State/Other</b>	<b>Primary Habitat Associations</b>	<b>Status on Site or Potential to Occur</b>
<b>Fish</b>			
There is no potential for occurrence of special-status fishes due to lack of suitable habitat.			
<b>Amphibians</b>			
There is no potential for occurrence of special-status amphibians due to lack of suitable habitat.			
<b>Reptiles</b>			
Coast horned lizard ( <i>Phrynosoma blainvillii</i> )	--/CSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Microhabitat requirements include open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Low potential to occur.
<b>Birds</b>			
Bank swallow ( <i>Riparia riparia</i> )	--/CT	Very uncommon spring transient and rare fall transient, and casual winter transient along the coast, formerly a fairly common summer resident, now virtually extirpated as a breeder in the region (Garrett and Dunn 1981).	Very low potential to occur as a transient; foraging, not nesting.
Black swift ( <i>Cypseloides niger</i> )	--/CSC	Rare and irregular transient through coastal district, nesting at a few steep waterfall locations in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981). Breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mts., and in coastal bluffs and mountains from San Mateo Co. south probably to San Luis Obispo Co. Nests in moist crevice or caves on sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons. Forages widely over many habitats (Zeiner et al. 1990b).	Very low potential to occur as a transient; foraging, not nesting.
Burrowing owl ( <i>Athene cunicularia</i> )	--/CSC	Open, dry annual or perennial grasslands, deserts, and	Low potential to occur as a transient;

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (<i>Scientific Name</i>)</b>	<b>Status Federal/State/Other</b>	<b>Primary Habitat Associations</b>	<b>Status on Site or Potential to Occur</b>
(burrow sites and some wintering sites)		scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel. Now extirpated from most of the coastal slope of the Los Angeles region (Garrett et al 2006). Now occurs mainly as a transient and winter visitor to coastal southern California.	not wintering or nesting.
Golden eagle ( <i>Aquila chrysaetos</i> ) (nesting and wintering)	--/CFP	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Moderate potential to forage over the site; not nesting.
Grasshopper sparrow ( <i>Ammodramus savannarum</i> )	--/CSC	Uncommon and very local summer resident on grassy slopes and mesas west of the deserts; noted only rarely in migration and in winter. For breeding, grasshopper sparrows require fairly continuous native grassland with occasional taller weedy stems or shrubs for singing perches (Garrett and Dunn 1981). Reported as casual in winter, uncommon spring and summer, and rare in fall in the Santa Monica Mountains.	Low potential to forage at the site; not nesting.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Status Federal/State/Other</b>	<b>Primary Habitat Associations</b>	<b>Status on Site or Potential to Occur</b>
Loggerhead shrike ( <i>Lanius ludovicianus</i> ) (nesting)	--/CSC	Very rare in open areas on the coastal slope of southern California; rare to uncommon in migration and winter. Only a few pairs of this once-abundant predator are still found in our coastal lowlands; small numbers of migrants augment this population from July to March in the Los Angeles region (Garrett et al. 2006). Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	Moderate potential to occur; foraging, and potentially nesting.
Mountain plover ( <i>Charadrius montanus</i> ) (wintering)	--/CSC	Flocks winter in bare and heavily grazed agricultural fields in the Antelope Valley. Now very rare in open grasslands near the coast; a few still winter at Seal Beach Naval Weapons Station. Restricted to western North America, where now gravely threatened (Garrett, K. et al. 2006).	Very low potential to occur while foraging; not nesting
Northern harrier ( <i>Circus cyaneus</i> ) (nesting)	--/CSC	Uncommon migrant and winter visitor (mid-September to early April) to extensive open freshwater and saltwater marshes, grasslands and agricultural fields. Breeding populations have been virtually extirpated from the coastal lowlands in the Los Angeles area (Garrett et al. 2006).	High potential to occur while foraging; not nesting.
Short-eared owl ( <i>Asio flammeus</i> )	--/CSC	Uncommon and local winter visitant along the coast, where it formerly nested. Wintering locations include Point Mugu, Sepulveda basin (Garrett and Dunn 1981). Usually found in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands (Zeiner	Low potential to occur as a transient; foraging, but not nesting.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Status Federal/State/Other</b>	<b>Primary Habitat Associations</b>	<b>Status on Site or Potential to Occur</b>
		et al. 1990b).	
Vaux's swift ( <i>Chaetura vauxi</i> )	--/CSC	Common migrant from mid-April to mid-May, and again from late August to early October; small flocks sometimes winter in coastal lowlands, but absent from the Los Angeles region from early June to early August (Garrett et al 2006). There is moderate high potential for this species to occur at any of the components, transient only, and not nesting.	Moderate potential to occur as a transient; foraging, but not nesting.
White-tailed kite ( <i>Elanus leucurus</i> ) (nesting)	--/CFP	Uncommon resident in open grasslands, valley oak savannas, marshes, and agricultural areas throughout the lowlands of the Los Angeles region (Garrett et al. 2006).	Observed foraging at the site; not nesting within project limits.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (Scientific Name)</b>	<b>Status Federal/State/Other</b>	<b>Primary Habitat Associations</b>	<b>Status on Site or Potential to Occur</b>
<b>Mammals</b>			
Pallid bat ( <i>Antrozous pallidus</i> )	--/CSC	Deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low potential to occur while foraging, but not reproducing, hibernating, or roosting at the site.
Spotted bat ( <i>Euderma maculatum</i> )	--/CSC	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	Moderate potential to occur while foraging, but not reproducing, hibernating, or roosting at the site.
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	--/CSC	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Low potential to occur while foraging, but not reproducing, hibernating, or roosting at the site.
Western mastiff bat ( <i>Eumops perotis californicus</i> )	--/CSC	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Moderate potential to occur while foraging, but not reproducing, hibernating, or roosting at the site.
Western red bat ( <i>Lasiurus blossevillii</i> )	--/CSC	Roosts primarily in trees, 2-40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	Moderate potential to occur while foraging, but not reproducing, hibernating, or roosting at the site.
American badger ( <i>Taxidea taxus</i> )	--/CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on	Moderate potential to occur while foraging, but not burrowing and inhabiting the site.

**Joint Powers Authority Rancho Recycled Water Pump Station 1MW Solar Generation Project  
Draft Initial Study and Mitigated Negative Declaration (MND)**

<b>Common Name (<i>Scientific Name</i>)</b>	<b>Status Federal/State/Other</b>	<b>Primary Habitat Associations</b>	<b>Status on Site or Potential to Occur</b>
		burrowing rodents. Digs burrows.	
<p><u>Federally Protected Species</u>            FE (Federal Endangered): A species that is in danger of extinction throughout all or a significant portion of its range.            FT (Federal Threatened): A species that is likely to become endangered in the foreseeable future.            FC (Federal Candidate): A species for which USFWS has sufficient information on its biological status and threats to propose it as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.            FSC (Federal Species of Concern): A species under consideration for listing, for which there is insufficient information to support listing at this time. These species may or may not be listed in the future, and many of these species were formerly recognized as "Category-2 Candidate" species.</p> <p><u>State Protected Species</u>            CE (California Endangered): A native species or subspecies which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.            CT (California Threatened): A native species or subspecies that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as "rare" on or before January 1, 1985, is a "threatened species."            CSC (California Species of Special Concern): Animals that are not listed under the California Endangered Species Act, but which nonetheless 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist.            CFP (California Fully Protected): This designation originated from the State's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians, reptiles, and birds. Most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. California Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.</p>			

This page is intentionally blank.

**APPENDIX C**  
**Proposed Solar Panel Alignment**

This page is intentionally blank.



This page intentionally left blank.

TITLE/PROJECT NAME  
**SPG G3.2 SunSeeker**

COMPONENT  
**Post Foundation Design Summary**

DATE  
**1/14/13**

ENGR  
**CTS**

JOB #  
**11920**

PAGE  
**53**

CODE  
**IBC 2009**

GOV. AGENCY

**Selected Summary of Design Input**

**System Loading**

Structure Dead Load = 4.98 psf  
 Basic Wind Speed = 85 mph  
 Exposure Category = C  
 Ground Snow Load = 0 psf  
 $S_s = 1.571$   
 $S_1 = 0.642$

**System Dimensions**

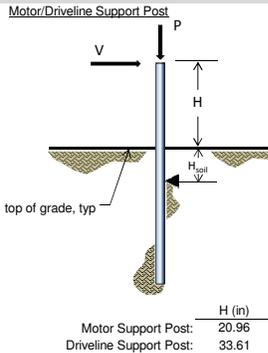
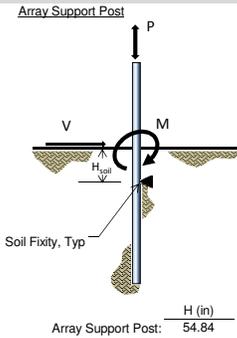
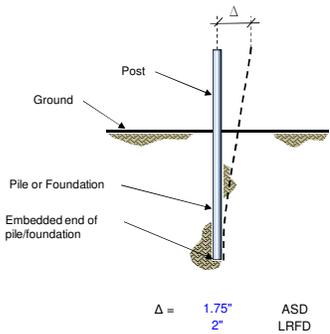
Number of Rows = 20  
 Row Length = 111'  
 Overhang/Bay Spacing = (4'/19.6667'/22.0833'/22'/22.0833'/21.1667')  
 Driveline Gap = 0.89'  
 Module Overhang = 4.00'  
 Motor Off Center Spacing = 34"

**Solar Panels**

Panel Modules = Suniva OPT315-72-4-100  
 Number of Assemblies = 17  
 $L_{ref} = 9.67'$   
 Thickness = 1.81 in  
 thermal gap between panel in long direction = 0.13 in

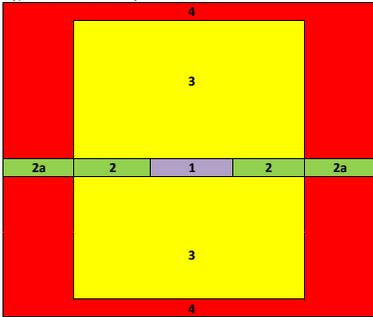
**Pile Models**

All post deflections shall be limited to the following:



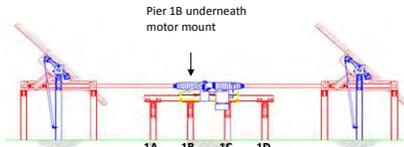
**Design Loads**

Typical Module Block Layout:



**Legend:**

1. motor support post
2. interior driveline support post
- 2a. exterior driveline support post
3. interior array support post
4. exterior array support post



**Support Post Breakdown**

Post	Desc.	Max Case	Unfactored Loads <sup>1</sup>			
			Dead		Wind	
			P (lb.)	V (lb.)	P (lb.)	V (lb.)
1A	MSP	-	±259.0	±587.8	±3230.2	±7332.4
1B	MSP	-	±246.4	±738.8	±3073.3	±9215.5
1C	MSP	-	±592.5	±483.8	±7390.7	±6034.6
1D	MSP	-	±87.2	±342.4	±1087.2	±4270.7

ASD Combo LRFD Combo			ASD Load <sup>1</sup> LRFD Load		
D	W	S	M (lb.ft.)	V (lb.)	P (lb.)
1	1	0	±7920.2	±3489.2	
1.2	1.6	0	±12437.2	±5479.1	
1	1	0	±9954.3	±3319.7	
1.2	1.6	0	±15631.4	±5213.0	
1	1	0	±6518.4	±7983.2	
1.2	1.6	0	±10235.9	±12536.2	
1	1	0	±4613.1	±1174.3	
1.2	1.6	0	±7244.0	±1844.1	

M = V x H (also see note 1)

Post	Desc.	Max Case	Unfactored Loads <sup>1</sup>				
			Dead		Wind		Snow
			P (lb.)	V (lb.)	P (lb.)	V (lb.)	P (lb.)
2	DLSP	-	±1018.8	±688.0	±781.1	±827.7	0.0

ASD Combo LRFD Combo			ASD Load <sup>1</sup> LRFD Load		
D	W	S	V (lb.)	P (lb.)	P (lb.)
1	1	0	±1515.7	±1799.9	
1.2	1.6	0.5	±2149.9	±2472.3	

M = V x H (note 1)

Post	Desc.	Max Case	Unfactored Loads <sup>2</sup>					Location		ASD Combo LRFD Combo			ASD Load <sup>2</sup> LRFD Load		
			Dead		Wind		Snow	Angle	Bay	D	W	S	M (lb.ft.)	V (lb.)	P (lb.)
			P (lb.)	V (lb.)	P (lb.)	V (lb.)	P (lb.)								
3	IASP	Moment	1060.9	-962.6	-962.6	-6434.2	0.0	45	3	0.6	1	0	-6434.2	-962.6	-326.1
		Uplift	1060.9	-962.6	-962.6	-6434.2	0.0	45	3	0.6	1	0	-10294.7	-1540.2	-585.4
		Down'rd	1060.9	1050.2	1050.2	4799.2	0.0	45	3	1	1	0	-6434.2	-962.6	-326.1
		Interaction	1060.9	-962.6	-962.6	-6434.2	0.0	45	3	0.9	1.6	0	-10294.7	-1540.2	-585.4
		Interaction	1060.9	-962.6	-962.6	-6434.2	0.0	45	3	1.2	1.6	0.5	4799.2	1050.2	2111.1
4	EASP	Moment	1060.9	-1487.7	-1487.7	-9432.3	0.0	45	3	0.6	1	0	-9432.3	-1487.7	-851.2
		Uplift	1004.8	-1474.1	-1474.1	-9290.0	0.0	45	2	0.6	1	0	-15091.6	-2380.3	-1425.5
		Down'rd	1060.9	1400.2	1400.2	6398.9	0.0	45	3	0.6	1	0	-9290.0	-1474.1	-871.2
		Interaction	1060.9	-1487.7	-1487.7	-9432.3	0.0	45	3	0.9	1.6	0	-14864.0	-2358.5	-1454.2
		Interaction	1060.9	-1487.7	-1487.7	-9432.3	0.0	45	3	1.2	1.6	0.5	6398.9	1400.2	2461.1

\*\* To maintain I-beam and row alignment, all relevant site conditions and effects (including differential settlement, the use of engineered fill, seasonal conditions, etc.) should be considered in foundation design.

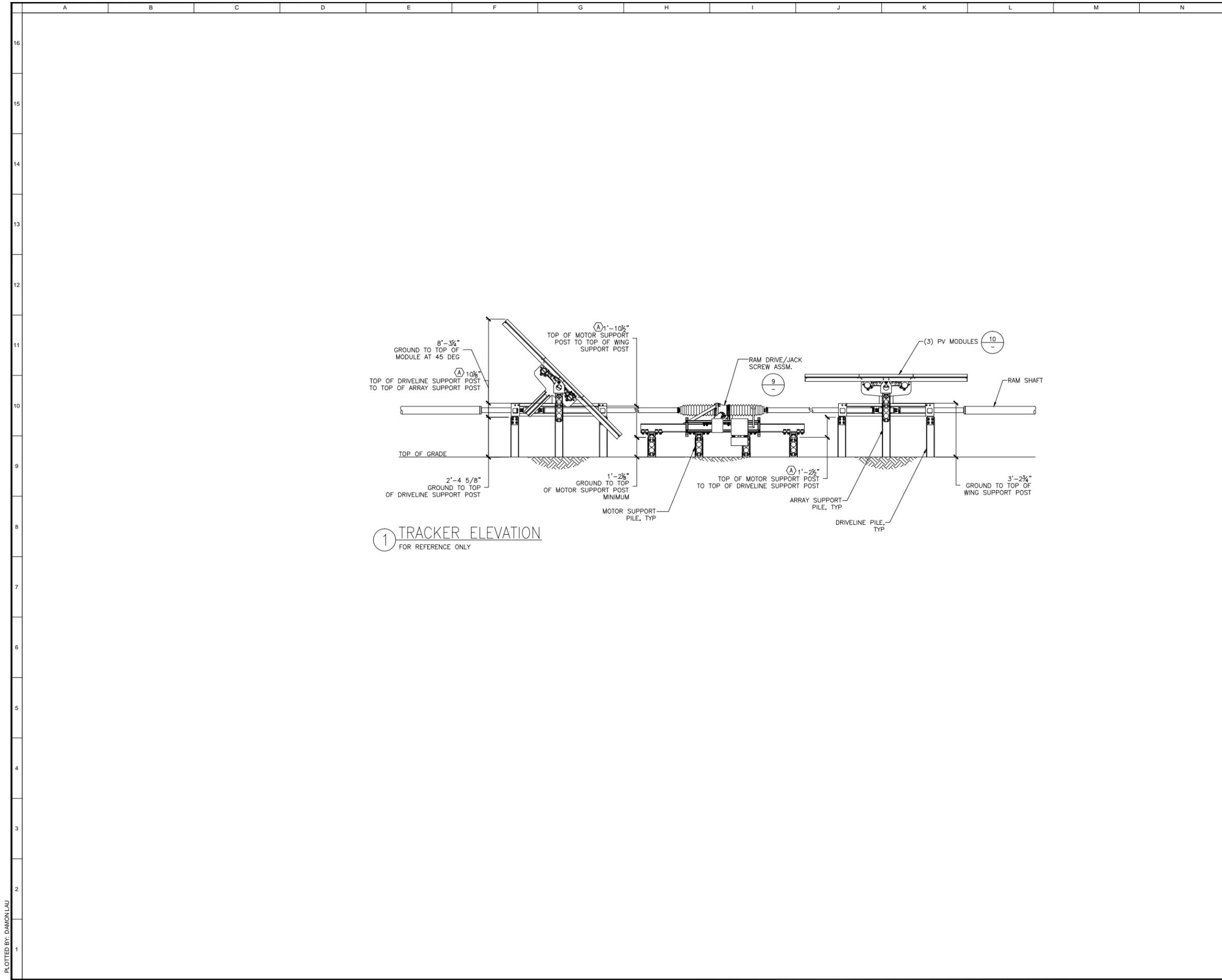
<sup>1</sup> Moment due to V x H for the motor pier is sufficient for the design of the required pier embedment. For the design of pier itself, moment loading due to "V" for motor & driveline pier design shall account for pier height "H" plus distance from top of grade to actual fixity of the soil base "H<sub>soil</sub>" per site specific soil.

<sup>2</sup> Moment provided for the array pier is sufficient in the design for required pier embedment. For the design of pier itself, additional moment due to soil layer fixity shall be added:  $M_{soil\ fixity} = V \times H_{soil}$ .

This page intentionally left blank.

**APPENDIX D**  
**Proposed Solar Panel Tracker Elevation Profile**

This page is intentionally blank.



1 TRACKER ELEVATION  
FOR REFERENCE ONLY

**NOTES**

- \*RELATIVE DIMENSIONS DENOTED WITH (A) TO BE CONSIDERED CRITICAL DIMENSIONS. SEE SUNSEEKER INSTALLATION MANUAL FOR ALLOWABLE CONSTRUCTION TOLERANCES.
- \* TORQUE VALUES ARE SUBJECT TO CONFIRMATION AND/OR MODIFICATION THROUGH A TORQUE CALIBRATION PROCEDURE TO ENSURE ADEQUATE BOLT TENSION IS ACHIEVED FOR THE SLIP CRITICAL CONNECTIONS.
- \* ASSEMBLY AND INSTALLATION WILL CONFORM TO SUNSEEKER SPECIFICATIONS.
- \* FOR MAXIMUM ALLOWABLE PILE HEIGHTS, SEE PILE DETAILS, SHEET S1.2
- \* FIELD CUT ROTATIONAL SUPPORT TUBE AT END OF EACH WING TO MATCH LAYOUT.

**SPGSOLAR**  
10379 N. MCDOWELL BLVD., SUITE B  
Petaluma, CA 94954  
LIC. #750006  
(707) 781-1000 (707) 781-1090 FAX

REV	DATE	DESCRIPTION

TITLE  
ADDRESS  
CITY, STATE ZIP CODE

STAMP:

REVIEW LIMITED TO STRUCTURAL FOUNDATION ITEMS ONLY. SEE STRUCTURAL NOTES ON SHEET S0.1

ENGINEER: SEMIC  
STRUCTURAL ENGINEER  
REVIEWER: GEORGE LAUDENBACH (415) 382-2178  
DESIGNER: (655) 555-5555  
CONSTRUCTION: (655) 555-5555 PM

50% REVIEW - NOT FOR CONSTRUCTION

PROJECT PHASE: 50% REVIEW

PROJECT No. \_\_\_\_\_

DATE: \_\_\_\_\_ SUBMITTAL DATE: \_\_\_\_\_

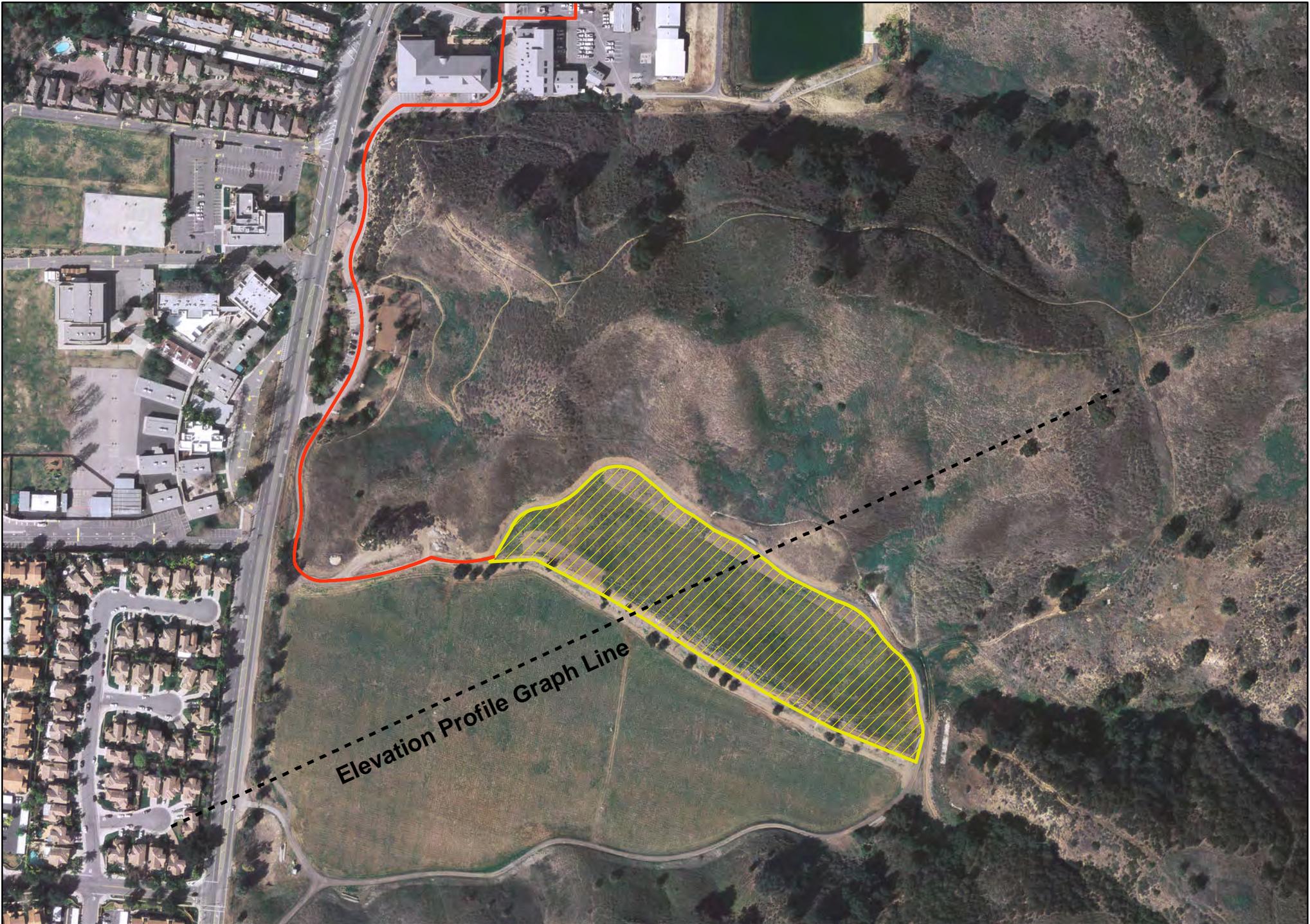
TITLE SHEET: TRACKER DETAILS

SHEET No. **S2.2**

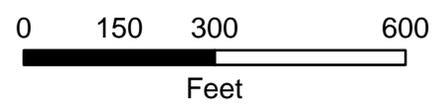
This page is intentionally blank.

**APPENDIX E**  
**Proposed Solar Panel Cross Section**

This page is intentionally blank.

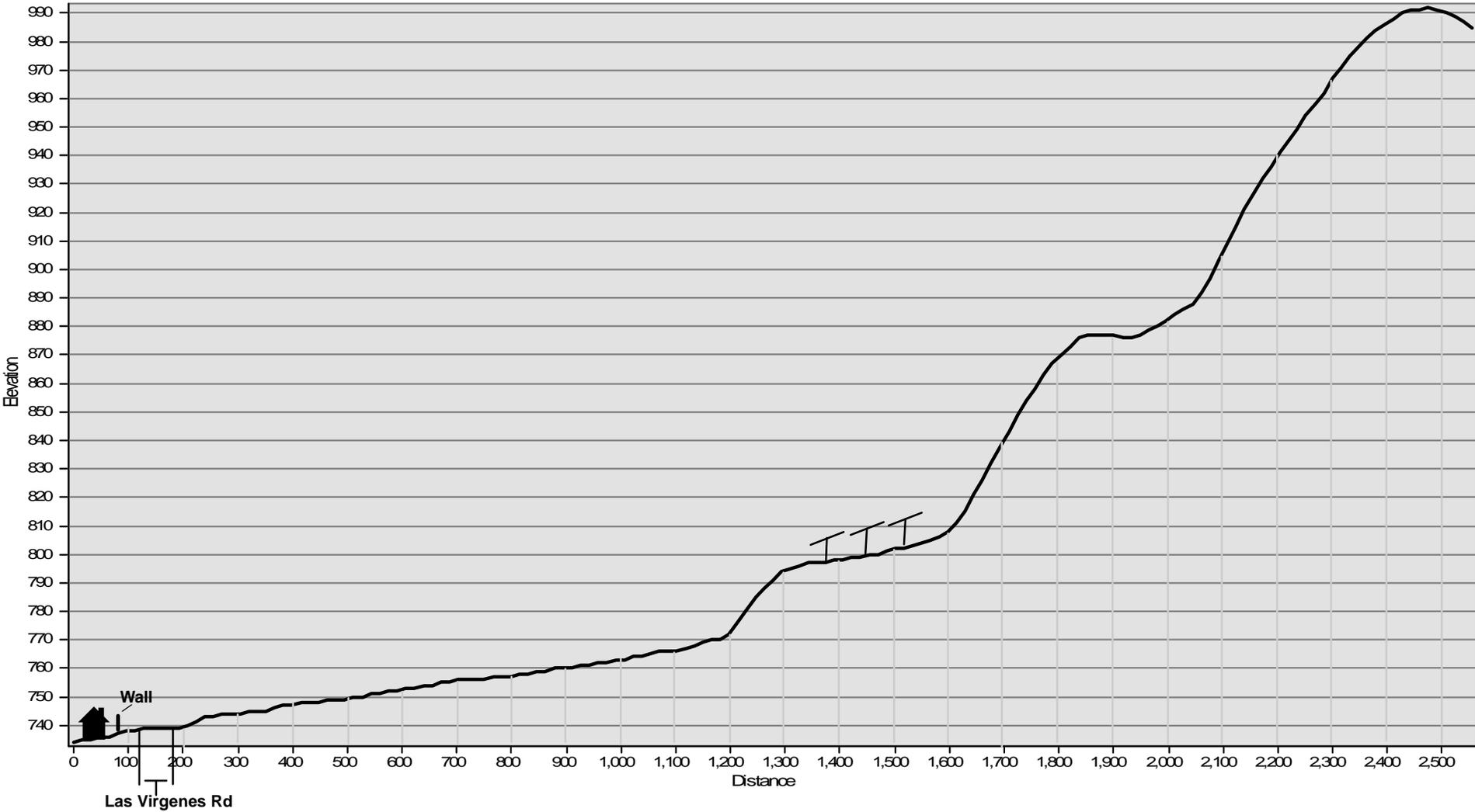


Elevation Profile Graph Line



This page intentionally left blank.

Solar Generation Project Elevation Profile



This page intentionally left blank.

**APPENDIX F**  
**Potential Impacts from Reflection of Proposed  
Calipatria Solar Farm I & II**

This page is intentionally blank.



## Potential Impacts from Reflection of Proposed Calipatria Solar Farm I & II

Draft Date: March 24, 2011

### KEY FINDINGS

- Flat-plate photovoltaic solar panels are engineered to absorb, not reflect, sunlight. A panel with a single layer of anti-reflective coating reflects less than 10% of the sunlight striking it. By way of comparison agriculture vegetation reflects between 18 and 25% of solar radiation.
- In order to maximize electricity production, panels are oriented toward the south and facing the sun, resulting in angles of reflection well above the built environment and nearby traffic corridors.

8minutenergy, LLC asked Good Company, a sustainability research and consulting firm, to prepare a high-level analysis of the potential for the reflection of sunlight at two proposed 50-megawatt photovoltaic ground-mounted arrays located in Imperial County, California. The proposed projects would make use of flat-plate, monocrystalline silicon photovoltaic modules. In conducting the reflection analysis, Good Company considered two design alternatives: 1) a south facing fixed-axis array and 2) a single-axis polar mounted array that partially tracks the path of the sun from east to west. This analysis focused on the direct reflection impacts from the Calipatria Solar Farm project on nearby traffic corridors, homes and buildings in and around the town of Calipatria and aircrafts utilizing Calipatria Municipal Airport.

***Based on the geometric configuration of the panels relative to the path of the sun and the inherently low reflectivity of flat-plate photovoltaic modules, it is highly unlikely that the proposed projects will result in hazardous glare conditions.***

### Reflectivity of Flat-plate Photovoltaic Solar Panels

Flat-plate photovoltaic solar panels are designed to absorb sunlight in order to convert it into electricity. Monocrystalline silicon wafers, the basic building block of most photovoltaic solar modules, absorb up to seventy percent of the sun's solar radiation in the visible light spectrum<sup>1</sup>. Solar cells are typically encased in a transparent material referred to as an encapsulant and covered with a transparent cover film, commonly glass. The addition of these protective layers further reduces the amount of visible light reflected from photovoltaic modules. Photovoltaic panels are using the absorbed energy in two ways; 1) the panels generate electricity, and 2) the mass of the panels heat up.

In order to maximize the efficiency of electricity production, photovoltaic manufacturers design their panels to minimize the amount of reflected sunlight. The most common methods to accomplish this are the application of anti-reflective coatings and surface texturing of solar cells. Combined, these techniques can reduce reflection losses to a few percent.<sup>2</sup> Most solar panels are now designed with at least one anti-reflective layer and some panels have multiple layers.

### Comparison of the Reflectivity of Solar Panel to the Surrounding Environment

One measure of the reflectivity is albedo—the ratio of solar radiation across the visible and invisible light spectrum reflected by a surface. Albedo varies between 0, a surface that reflects no light, and 1, a mirror-like surface that reflects all incoming light. Solar panels with a single anti-reflective coating have a reflectivity of around .10.<sup>3</sup> By comparison, sand has an albedo between .15 and .45 and agricultural vegetation has an albedo between .18 and .25.<sup>4</sup> In other words, the solar panels have a lower reflectivity

<sup>1</sup> Luque and Hegedus. 2003. *Handbook of Photovoltaic Science and Engineering*. Wiley and Sons, New Jersey.

<sup>2</sup> Ibid.

<sup>3</sup> Lasnier and Ang. 1990. *Photovoltaic Engineering Handbook*. New York: Taylor & Francis.

<sup>4</sup> Budikova, Dagmar. 2010. "Albedo." *Encyclopedia of Earth*. Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment. Retrieved July 5, 2010 at <http://www.eoearth.org/article/Albedo>.

than the area's prevailing ground cover, agricultural crops.

### **Visibility of a Direct Reflection of Sunlight**

In order to maximize electricity production, the solar panels will be oriented toward the south and facing the sun. For this analysis it was assumed that the panels would face polar south and be tilted at 25 degrees above horizontal.

The position of the sun relative to the solar panels will vary by the time of day and season of the year. As a result the angle of direct reflection from the panels will also vary by the time of year and hour of the day. The greatest likelihood of a low-angle of direct reflection that might impact the built environment occurs midday on the summer solstice when the sun is at its highest point in the sky and the angle of reflection is lowest (see figure below).

At this time of year at the proposed projects' latitude, the sun's solar elevation is approximately 80 degrees<sup>5</sup>. At 80 degrees, the resulting angle of direct reflection is approximately 50 degrees. It is highly unlikely that any objects in the built environment would be adversely affected by a direct reflection of sunlight from this angle, including vehicles traveling on nearby roads or aircraft approaching or taking off from Calipatria Municipal Airport.

At a distance of only 20 feet (the approximate distance from the southeastern edge of Calipatria Solar Farm II to the center of Blair Rd.), the height of the reflected sunlight from the array would exceed 20 feet in elevation, well above the California truck height limit of 14 feet. This is also the case for all roads due south of the panel arrays. At a distance of one mile, the height of the reflected sunlight would be over 6,200 feet—more than a third of a mile higher than Blue Angle Peak, the highest point in Imperial County.

The nearest built structures to the Calipatria Solar Farm site are due south of Solar Farm I, across Young Road, approximately 250 feet from the edge of the array. At this distance, the height of direct reflection is approximately 300 feet. The residential neighborhood at the northeastern corner of Calipatria is 0.25 miles from the southwestern corner of Solar Farm I. At this distance, the height of direct reflection is 1,519 feet.

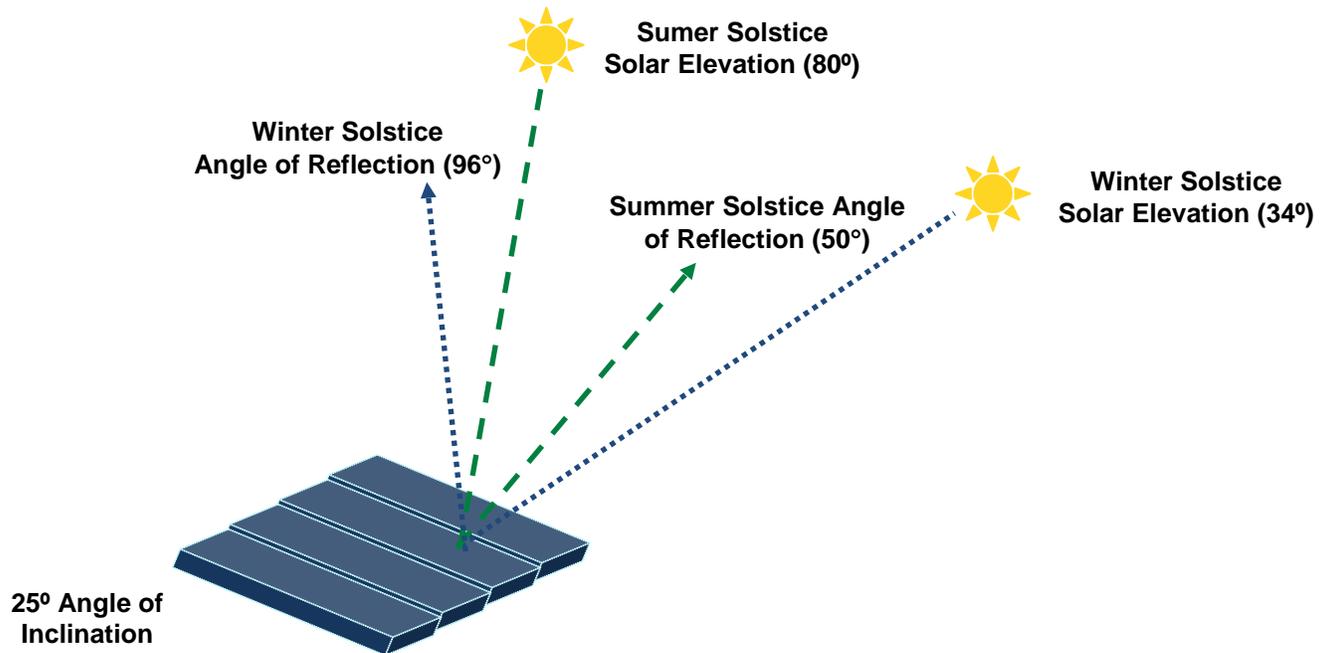
The Calipatria Municipal Airport's runway runs parallel to the southern edge of Solar Farm I about 600 feet due south and about 0.4 miles to the west. Planes landing from east to west would fly parallel to the southern edge of the Solar Farm I solar array for approximately 0.9 miles. At 600 feet, the direct glare would have a minimum elevation of 700 feet. Assuming a glide path of 3 degrees, the elevation of an arriving aircraft at the southeastern most edge of the Solar Farm I array is 360 feet, which is well below the minimum elevation of the direct glare.

During the winter months, when the sun travels across the sky at lower angles relative to the horizon, the angle of reflection and the resulting height of the reflected sunlight are higher. At midday on the winter solstice at the proposed projects' latitude, the sun's solar elevation is approximately 34 degrees. At this angle of elevation, the resulting angle of reflection is 96 degrees. At this angle of reflection, the height of the reflected sunlight would exceed 190 feet in elevation at a distance of only 20 feet away and the further away from the array the greater the height of the reflected sunlight.

---

<sup>5</sup> Based on a Sun Path Chart produced using the University of Oregon Solar Radiation Monitoring Laboratory's Sun Chart software available on-line at <http://solardat.uoregon.edu/SunChartProgram.php> and assuming a latitude of 33.16 degrees north. A copy of the chart is attached at the end of this document.

## Variation in the Angle of Reflection Throughout the Year



### Visibility of an Indirect Reflection of Sunlight

While the foregoing discussion considers direct reflection in theory, we must also consider the potential for indirect reflections (the visibility of diffused sunlight on the surface of the panels). As with the potential for direct reflections, indirect reflections are not a significant concern<sup>6</sup>. Indirect reflections are by definition significantly less intense—for example, moving just 30 degree off a direct reflection lowers light intensity by nearly 80%<sup>7</sup>. While at certain times of the day an observer would have a view of an indirect reflection, the relative intensity of the reflection would not be significant or a concern. Additionally the project developer has proposed to construct an 8-foot slatted fence around the perimeter of the project further obscuring the peripheral view of the project (and any indirect reflection) for drivers traveling past the project.

### Comparison of Fixed Mount and Single-axis Tracking Mount on Direct Solar Reflection

Like the fixed-axis array configuration, the panels of a single-axis tracking array would also have an angle of inclination of approximately 25 degrees. Since this angle of inclination remains constant between the two configurations, the lowest potential angle of reflection remains the same. As with a fixed-axis array, the greatest potential for a low angle of reflection from a single-axis tracking mount that might impact the built environment occurs midday on the summer solstice when the sun is at its highest point in the sky.

The key difference between a fixed-axis and single-axis tracking configuration is the cardinal direction of reflected sunlight. At midday on the summer solstice, the time of year most likely to produce a low angle of reflection, both configurations would be facing south and reflect light back in the same direction. At other times of the year the angles of reflection would be higher and as such the height of direct reflection

<sup>6</sup> A number of other studies conducted for proposed solar projects have sought to quantify the potential for the diffuse reflection of sunlight from the surface of solar panels and reached similar conclusions. For additional information see “Panoche Valley Solar Farm Project Glint and Glare Study” ([www.panochesolar.info/app/jun2010/Glint\\_Glare\\_Study.pdf](http://www.panochesolar.info/app/jun2010/Glint_Glare_Study.pdf)) and “Topaz Solar Farm Reflection Study” (<http://www.slocounty.ca.gov/Assets/PL/Optisolar-Topaz+Solar+Farm/Documents/Application+Submittal+232/Attachment+C++Topaz+Solar+Farm+Reflection+Study.pdf>).

<sup>7</sup> TrinaSolar. “Reflection Coefficient of Trina Solar Modules.” Personal communication with Thomas Houghton, June 30, 2010.

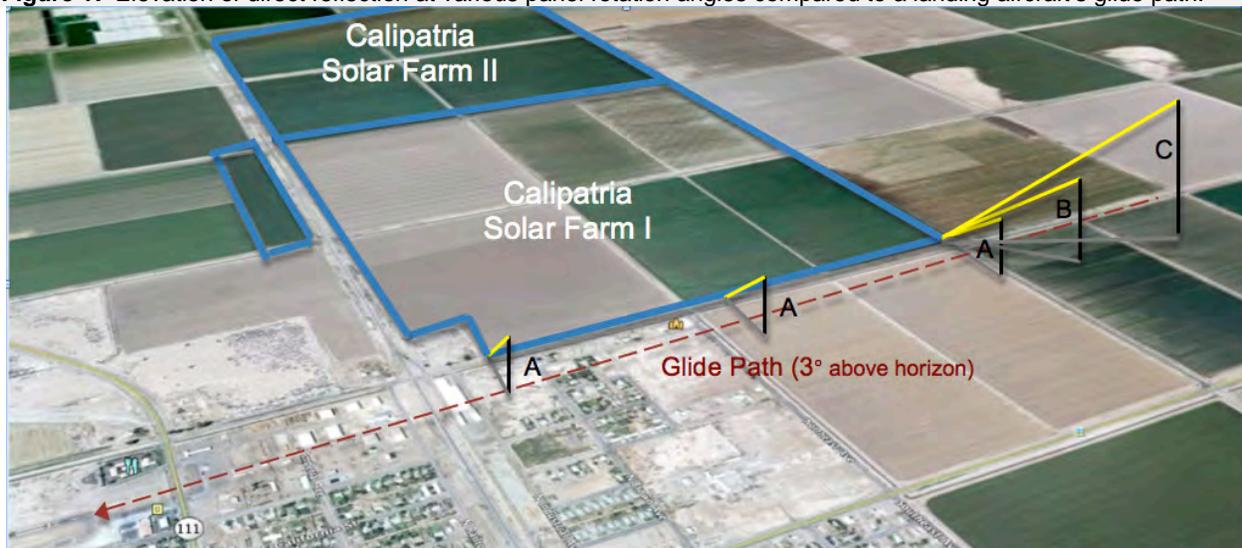
would increase compared to summer solstice.

The greatest potential for intersection between direct glare from the Calipatria Solar Farm arrays and the built environment comes from aircrafts using the Calipatria Airport, specifically those landing from east to west. This landing orientation necessitates that aircrafts fly parallel and due south of the solar array for a portion of the approach, but not the final 0.4 miles. This particular landing also opens the pilot's sightline to direct reflection when the panels are rotated east from due south as the array is in front of the approaching aircraft. Figure 1 provides a visual representation of the scenario being described.

The yellow lines on Figure 1 show the angle of reflection at various panel rotation angles relative to a typical aircraft landing glide path (all angles do not happen concurrently – see Figure 2 for more detail). As can be seen, a landing aircraft's glide path (red dotted line) is expected to be below the lowest angle of direct reflection (based on a 3 degree glide path<sup>8</sup>). Figure 2 provides the values used to create Figure 1 in tabular form.

It is conceivable that an aircraft flying over the array may momentarily experience direct glare from the solar array, but the reflection intensity from the panels is only half compared to agricultural vegetation. For more see the section titled *Comparison of the Reflectivity of Solar Panel to the Surrounding Environment*.

**Figure 1:** Elevation of direct reflection at various panel rotation angles compared to a landing aircraft's glide path.



Marker on Figure 2		A	B	C
Time of Day (on June 21st)	hours of day	12:00 PM	11:40 PM	11:15PM
Angle of Panel (degrees west of due south)	degrees	0	22.5	45.0
Solar Elevation (based on Solar Azimuth on June 21st)	degrees	81	80	76
Plane from Runway - On the Ground Distance	feet	6,882	7,130	7,310
<b>Minimum Elevation of Direct Reflection</b>	<b>feet</b>	<b>690</b>	<b>774</b>	<b>1,168</b>
<b>Glide Path Elevations at On the Ground Distance (3° glide path)</b>	<b>feet</b>	<b>360</b>	<b>374</b>	<b>392</b>

<sup>8</sup> The source of Glide Path angle is the FAA *Aeronautical Information Manual, Chapter 2*. This document may be accessed online at [http://www.faa.gov/air\\_traffic/publications/ATpubs/AIM/Chap2/aim0201.html](http://www.faa.gov/air_traffic/publications/ATpubs/AIM/Chap2/aim0201.html).

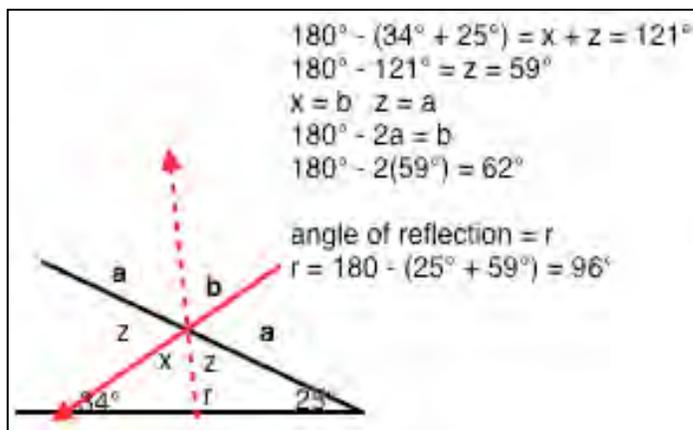
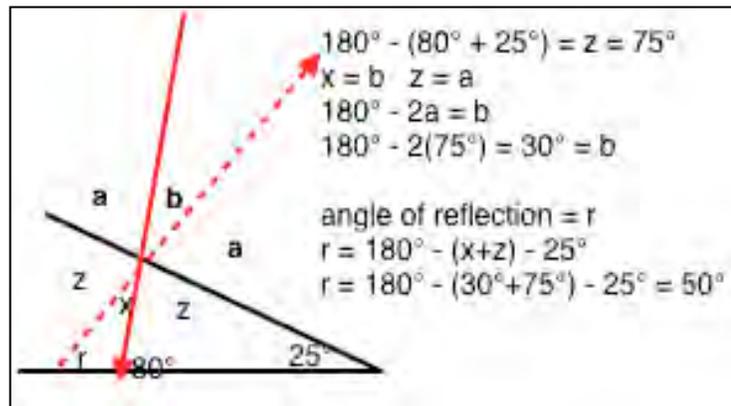
**Figure 2:** Minimum elevation of direction reflection compared to aircraft landing glide path (see **bold** text).

## Appendix I: Glare Analysis Explanation

### Angle of Direct Reflection Off Panels

According to the sun path diagram charting the sun's movement at the proposed project's latitude, the sun is shining at its highest point at 12:00 PM on the summer solstice (June 21).<sup>9</sup> At this point the sun is shining at an 80-degree angle directly upon the south facing solar panels. Note that the fixed-tilt solar panels are set at 25°.

The diagram to the right depicts this reflection. All angles within a triangle add up to 180°. From this rule it is simple algebra to obtain that **z** equals 75°. Because **a** and **z** are vertical angles, **a** also equals 75°. Once **b** is calculated (a flat plane also equals 180° so subtracting  $180^\circ - 2a$  equals **b**) the calculation of the angle of the sun's reflection is easy to complete using the same formula ( $180^\circ - (z + x) - 25^\circ$ ).

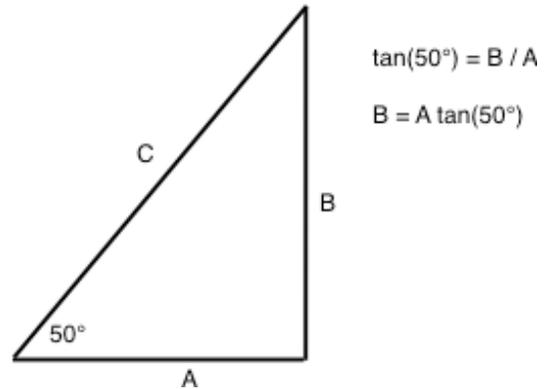


Similar calculations are performed to determine the angle of the sun's reflection when the sun hits the solar panels at a low point (in the example to the left, a 34-degree angle). From determining that **x** plus **z** equals 121° ( $180^\circ - 34^\circ - 25^\circ$ ) and looking at the vertical angles ( $x = b$ ) and ( $z = a$ ), it is then possible to calculate that the angle of the sun's reflection is 96° ( $r = 180^\circ - z - 25^\circ$ ).

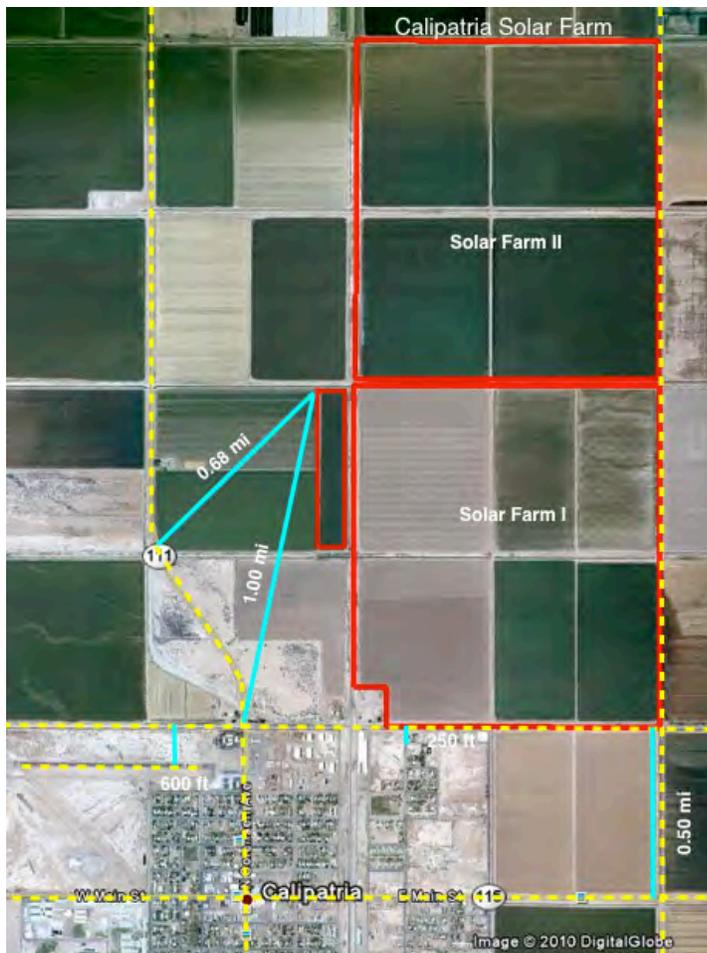
<sup>9</sup> Based on a Sun Path Chart produced using the University of Oregon Solar Radiation Monitoring Laboratory's Sun Chart software available on-line at <http://solardat.uoregon.edu/SunChartProgram.php> and assuming a latitude of 33.16 degrees north.

## Determining the Height of Reflection

Given the preliminary project plans provided, the solar panels do not cause a direct glare on any nearby roads. Trigonometry calculations are used to project the height of the reflection. It is important to point out that there are no notable elevation rises surrounding the sited Calipatria Solar Farm. The visual to the right shows the basic calculations to determine the height of the sun's reflection. In the visual, A is representative of the horizontal distance. Any distance measurement can be input into the formula to find B, which represents the height of the sun's reflection at the distance input.



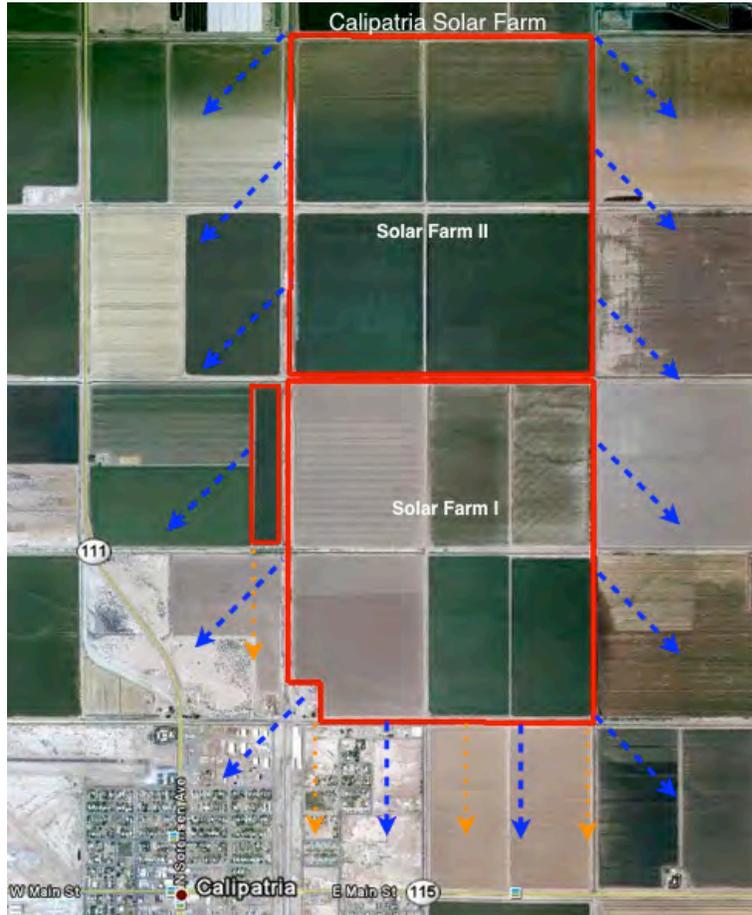
The picture of the sited Calipatria Solar Farm from Google Earth (below) has overlaying lines to show clearly the distance to nearby roads, built structures and the airport flight path. Blair Road runs parallel to the site on the east side. Highway 111 runs parallel to the site on the west side. Young Road runs parallel to the south side of the project.



- The center of nearby roads is approximately 20 feet from the solar panels. At this distance the height of the reflection is 23.8 feet.
- The nearest built structures to the Calipatria Solar Farm site are due south of Solar Farm I, across Young Road, approximately 250 feet from the edge of the array. At this distance, the height of direct reflection is 298 feet.
- At 0.5 miles from the solar panels the height of the reflection equals 0.6 miles (3,147 feet).
- At 0.68 miles from the solar panels the height of the reflection equals 0.81 miles (4,279 feet).
- At 1.0 miles from the solar panels the height of the reflection equals 1.2 miles (6,294 feet).

## Panels On a Single-axis Tracker

The proposed project may also feature panels mounted on single-axis polar trackers enabling the panels to rotate 45° off of due south. The single-axis tracker will widen the area of reflection, but no reflection will fall below the lowest angle of 50°. The visual to the right depicts this difference with the blue dashed lines representing the reflection from the panels mounted on the single-axis tracker and the orange dotted lines representing the panels at a set tilt.



## Potential Impacts from Reflection of Proposed Midway Solar Farm I (83 WI)

Draft Date: December 17, 2010

### KEY FINDINGS

- Based on the geometric configuration of the panels relative to the path of the sun and the inherently low reflectivity of flat-plate photovoltaic modules it is highly unlikely that the proposed projects will result in hazardous glare conditions. This is true regardless of the panel mounting system selected.
- Flat-plate photovoltaic solar panels are engineered to absorb, not reflect, sunlight. A panel with a single layer of anti-reflective coating reflects less than 10% of the sunlight striking it. By way of comparison, agriculture vegetation reflects between 18 and 25% of solar radiation.
- In order to maximize electricity production, panels are oriented toward the south and facing the sun, resulting in angles of reflection well above the built environment and nearby traffic corridors.

8minutenergy LLC asked Good Company, a sustainability research and consulting firm, to prepare a high-level analysis of the potential for hazardous glare conditions at the proposed Midway Solar Farm I project site located in Imperial County, California. The project site consists of a single parcel (one tax lot) of land with an area of 326 acres. See Appendix A for aerial photographs of the site.

The proposed project is a 50-megawatt ground-mounted photovoltaic array that would make use of flat-plate, monocrystalline silicon photovoltaic modules. In conducting this reflection analysis, Good Company considered two design alternatives: 1) a south facing fixed-axis array and 2) a single-axis polar mounted array that partially tracks the path of the sun from east to west.

This analysis focuses on the direct glare impacts from the Midway Solar Farm I project on nearby traffic corridors and buildings.

### Reflectivity of Flat-plate Photovoltaic Solar Panels

Flat-plate photovoltaic solar panels are designed to absorb sunlight in order to convert it into electricity. Monocrystalline silicon wafers, the basic building block of most photovoltaic solar modules, absorb up to 70 percent of the sun's solar radiation in the visible light spectrum.<sup>1</sup> Solar cells are typically encased in a transparent material referred to as an encapsulant and covered with a transparent cover film, commonly glass. The addition of these protective layers further reduces the amount of visible light reflected from photovoltaic modules. Photovoltaic panels are using the absorbed energy in two ways; 1) the panels generate electricity, and 2) the mass of the panels heat up.

In order to maximize the efficiency of electricity production, photovoltaic manufacturers design their panels to minimize the amount of reflected sunlight. The most common methods to accomplish this are the application of anti-reflective coatings and surface texturing of solar cells. Combined, these techniques can reduce reflection losses to a few percent.<sup>2</sup> Most solar panels are now designed with at least one anti-reflective layer and some panels have multiple layers.

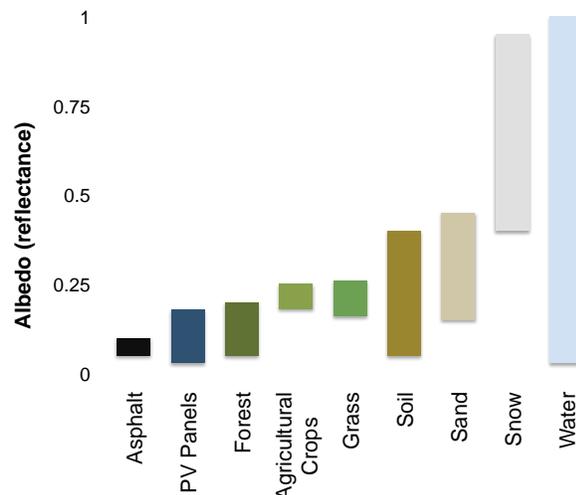
<sup>1</sup> Luque and Hegedus. 2003. *Handbook of Photovoltaic Science and Engineering*. Wiley and Sons, New Jersey.

<sup>2</sup> Ibid.

## Comparison of the Reflectivity of Solar Panel to the Surrounding Environment

One measure of the reflectivity is albedo, the ratio of solar radiation across the visible and invisible light spectrum reflected by a surface. Albedo varies between 0, a surface that reflects no light, and 1, a mirror-like surface that reflects all incoming light. Solar panels with a single anti-reflective coating have a reflectivity of between .03 and .18.<sup>3</sup> By comparison, sand has an albedo between .15 and .45 and agricultural vegetation has an albedo between .18 and .25.<sup>4</sup> In other words, the solar panels have a lower reflectivity than the area's prevailing ground cover, agricultural crops.

Figure 1: Albedo comparison for various surfaces.



## Visibility of a Direct Reflection of Sunlight for South Facing Fixed Mount Panels

In order to maximize electricity production, fixed (non-tracking) solar panels must be oriented toward the sun as much as possible. Per project specifications, this analysis assumes that the panels will face polar south at a tilt of 25 degrees above horizontal.

The position of the sun relative to the solar panels will vary by the time of day and time of year. As a result, the angle of direct reflection from the panels will also vary accordingly. The greatest likelihood of a low-angle of direct reflection that might impact the built environment occurs midday on the summer solstice (June 21<sup>st</sup>) when the sun is at its highest point in the sky and the angle of reflection is lowest (see Figure 2 below). The potential impact at that moment is the best proxy for maximum impact overall.

During summer solstice at the proposed project's latitude, the sun's solar elevation is approximately 80 degrees.<sup>5</sup> With the sun at this height, the resulting angle of direct reflection is approximately 50 degrees above the horizon. With the sun at this angle at a distance of only 20 feet (the approximate distance from the southeastern edge of the project to the center of E. Peterson Rd.), the height of the reflected sunlight from the array would exceed 20 feet in elevation, well above the California truck height limit of 14 feet. It should be noted that E. Peterson Rd. is not paved and therefore is not expected to support regular passenger or commercial traffic.

The nearest paved road to the site is Brandt Rd., which is 0.7 miles west of the site and runs north-south. At a distance of half a mile the height of reflection exceeds 3,100 feet and for a distance of one mile the height is over 6,200 feet<sup>6</sup>—more than a third of a mile higher than Blue Angle Peak, the highest point in Imperial County.

The nearest built structure to the site is a farm to the west of the project site. The farm is a campus of buildings with the nearest approximately 0.75 miles from the northwest corner of the proposed solar

<sup>3</sup> Lasnier and Ang. 1990. *Photovoltaic Engineering Handbook*. New York: Taylor & Francis.

<sup>4</sup> Budikova, Dagmar. 2010. "Albedo." *Encyclopedia of Earth*. Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment. Retrieved July 5, 2010 at <http://www.eoearth.org/article/Albedo>.

<sup>5</sup> Based on a Sun Path Chart produced using the University of Oregon Solar Radiation Monitoring Laboratory's Sun Chart software available on-line at <http://solardat.uoregon.edu/SunChartProgram.php> and assuming a latitude of 33.16 degrees north. A copy of the chart is attached at the end of this document.

<sup>6</sup> This height is more than double the height of Burj Khalifa in Dubai, currently the tallest building in the world at just over 2,700 feet.

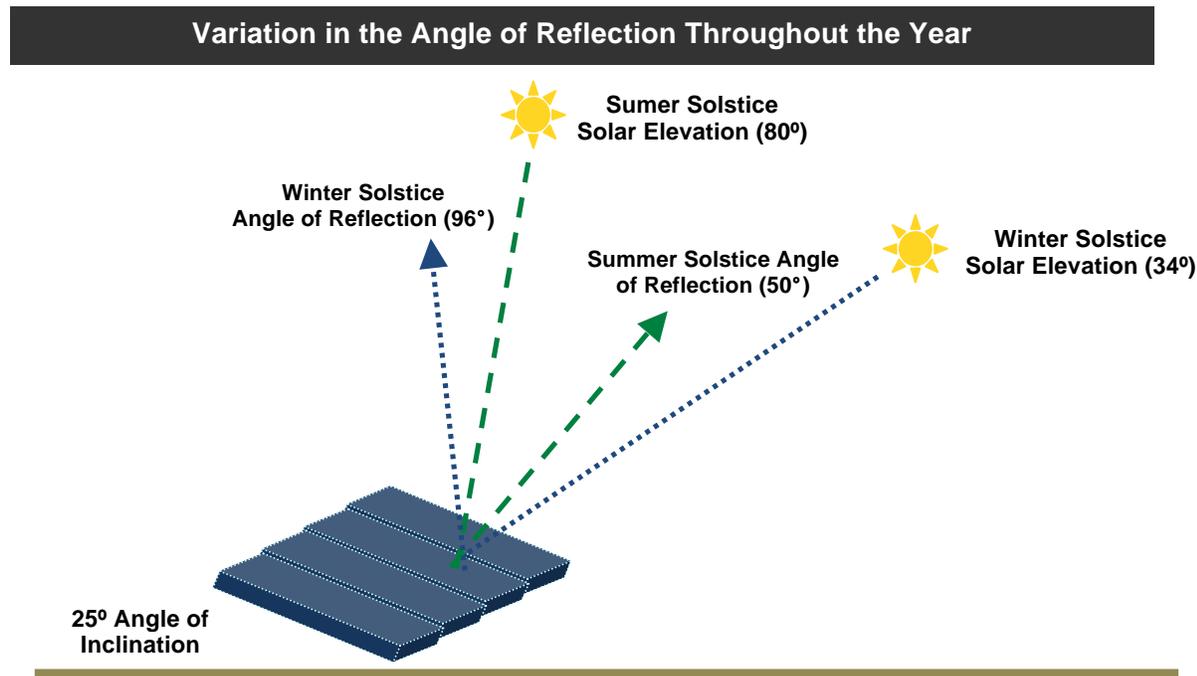
facility. At this distance, the elevation of direct glare would exceed 3,100 feet, the height of a 200-floor building.<sup>7</sup>

The Calipatria Municipal Airport is located southeast of the proposed location for the Midway Solar Farm I. Aircraft approaching or departing west would pass due south of the Midway Solar Farm I at a distance of 2.1 miles. At this distance, direct reflection from fixed south facing panels would have an elevation of over 13,214 feet. This elevation represents the lowest point of direct reflection due south of the array at a distance perpendicular to the flight path of aircrafts approaching and departing Calipatria Municipal Airport.<sup>8</sup>

It is possible that aircraft may experience momentary direct or indirect reflection from the array at Midway Solar Farm I. These occurrences are dependent on a number of factors including time of year, time of day, altitude, aircraft relationship to the array, etc. With that said, the albedo (measure of reflectance) of the PV modules is lower than other common surfaces in the surrounding area, including agricultural vegetation. In addition, large-scale solar projects have been installed at or near major airports (e.g. a 750 kW array at Oakland International Airport) without incident or serious complaints.<sup>9</sup>

During the winter months, when the sun travels across the sky at lower angles relative to the horizon, the angle of reflection and the resulting height of the reflected sunlight are higher. At midday on the winter solstice at the proposed project's latitude, the sun's solar elevation is approximately 34 degrees. At this angle of elevation, the resulting angle of reflection is 96 degrees. At this angle, the height of the reflected sunlight would exceed 190 feet in elevation at a distance of only 20 feet away and the further away from the array the greater the height of the reflected sunlight.

**Figure 2:** The range of the sun's angle-of-reflection depending on the time of year.



<sup>7</sup> This number of floors assumes a height of 15 feet per floor.

<sup>8</sup> Details about typical aircraft traffic patterns, frequency of use and operating elevations were not available for this analysis.

<sup>9</sup> Federal Aviation Administration. 2010. *Technical Guidance for Evaluating Selected Solar Technologies on Airports*. Page 41.

Online at

[http://www.faa.gov/airports/environmental/policy\\_guidance/media/airport\\_solar\\_guide\\_print.pdf](http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide_print.pdf) [http://www.faa.gov/airports/.../policy\\_guidance/.../airport\\_solar\\_guide\\_print.pdf](http://www.faa.gov/airports/.../policy_guidance/.../airport_solar_guide_print.pdf)

### **Visibility of an Indirect Reflection of Sunlight**

While this analysis focuses on direct reflection in theory, we must also consider the potential for indirect reflections (the visibility of diffused sunlight on the surface of the panels). As with the potential for direct reflections, indirect reflections are not a significant concern.<sup>10</sup> Indirect reflections are by definition significantly less intense—for example, moving just 30 degree off a direct reflection lowers light intensity by nearly 80 percent.<sup>11</sup> While at certain times of the day an observer may have a view of an indirect reflection, the relative intensity of the reflection would not be significant or a concern. Additionally, the project developer has proposed to construct an 8-foot slatted fence around the perimeter of the project further obscuring the peripheral view of the project (and any indirect reflection) at ground level.

### **Comparison of Fixed Mount and Single-axis Tracking Mount on Direct Solar Reflection**

Like the fixed-axis array configuration, the panels of a single-axis tracking array would also have an angle of inclination of approximately 25 degrees. Since this angle of inclination remains constant between the two configurations, the lowest potential angle of reflection remains the same. As with a fixed-axis array, the greatest potential for a low angle of reflection that may impact the built environment occurs at midday on the summer solstice when the sun is at its highest point in the sky.

The key difference between a fixed-axis and single-axis tracking configuration is the cardinal direction of reflected sunlight. At midday on the summer solstice, the time of year most likely to produce a low angle of reflection, both configurations would be facing south and reflect light back in the same direction. At other times of the year and times of the day the angles of reflection would be higher and as such, the height of direct reflection would increase compared to noon on summer solstice.

---

<sup>10</sup> A number of other studies conducted for proposed solar projects have sought to quantify the potential for the diffuse reflection of sunlight from the surface of solar panels and reached similar conclusions. For additional information see “Panoche Valley Solar Farm Project Glint and Glare Study” ([www.panochesolar.info/app/jun2010/Glint\\_Glare\\_Study.pdf](http://www.panochesolar.info/app/jun2010/Glint_Glare_Study.pdf)) and “Topaz Solar Farm Reflection Study” (<http://www.slocounty.ca.gov/Assets/PL/Optisolar-Topaz+Solar+Farm/Documents/Application+Submittal+232/Attachment+C++Topaz+Solar+Farm+Reflection+Study.pdf>).

<sup>11</sup> TrinaSolar. “Reflection Coefficient of Trina Solar Modules.” Personal communication with Thomas Houghton, June 30, 2010.

## Appendix A: Glare Analysis Explanation

### Angle of Direct Reflection Off Panels

According to the sun path diagram charting the sun's movement at the proposed project's latitude, the sun is shining at its highest point at 12:00 PM on the summer solstice (June 21).<sup>12</sup> At this point the sun is shining at an 80-degree angle directly upon the south facing solar panels. This analysis assumes that the panels will face polar south at a tilt of 25 degrees above horizontal.

Figure 3 to the right depicts this reflection. All angles within a triangle summed equal 180°. From this rule it is simple algebra to obtain that **z** equals 75°. Because **a** and **z** are vertical angles, **a** also equals 75°. Once **b** is calculated (a flat plane also equals 180° so subtracting **180° - 2a** equals **b**) the calculation of the angle of the sun's reflection is easy to complete using the same formula (**180° - (z + x) - 25°**). The angle of the sun's reflection is 50°.

Figure 3: Angle of direct reflection on summer solstice (June 21).

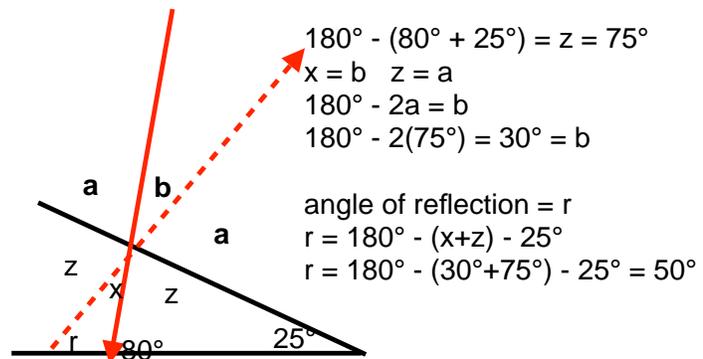
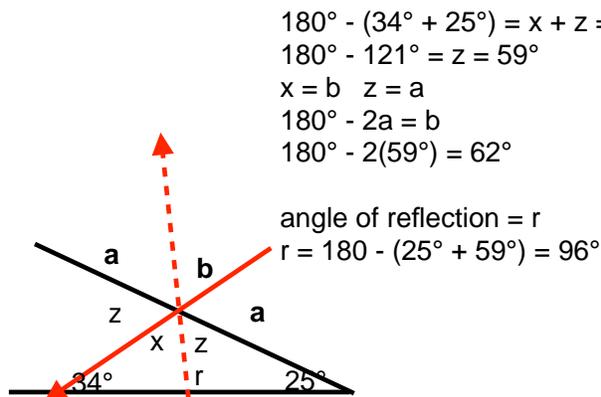


Figure 4: Angle of direct reflection on winter solstice (Dec. 21).



Similar calculations are performed to determine the angle of the sun's reflection when the sun hits the solar panels at a low point during winter solstice on December 21st (see Figure 4, a 34-degree angle). From determining that **x** plus **z** equals 121° (**180° - 34° - 25°**) and looking at the vertical angles (**x = b**) and (**z = a**), it is then possible to calculate that the angle of the sun's reflection is 96° (**r = 180° - z - 25°**).

<sup>12</sup> Based on a Sun Path Chart produced using the University of Oregon Solar Radiation Monitoring Laboratory's Sun Chart software available on-line at <http://solar.dat.uoregon.edu/SunChartProgram.php> and assuming a latitude of 33.16 degrees north.

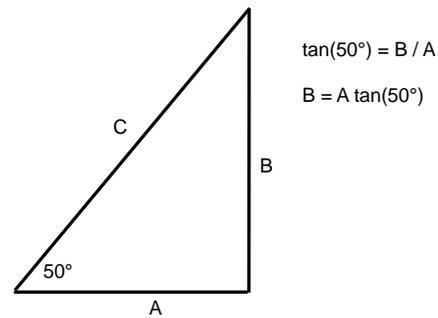
### Determining the Height of Reflection

Given the preliminary project plans provided, the solar panels do not cause a direct glare on the built environment and nearby traffic corridors.

The lowest potential reflection angle, determined to be 50°, was used to estimate the height of the sun's reflection. Trigonometry calculations are used to project the height of the reflection. It is important to point out that there are no notable elevation rises surrounding the sited Midway Solar Farm I project. Figure 5 shows the basic calculations to determine the height of the sun's reflection.

In the visual, A is representative of the horizontal distance. Any distance measurement can be input into the formula to find B, which represents the height of the sun's reflection at the distance input.

**Figure 5:** Calculation to determine direct reflection.



**Figure 6:** Aerial image of the Midway Solar Farm I project site.



The picture of the sited Midway Solar Farm I project from Google Earth (Figure 6) has overlaying lines to show clearly where the roads regularly used are located (yellow-dashed lines). The picture also notes how far these roads and buildings are from the slated site and potential direct reflection of the panels (blue lines). Note that the following heights assume that the reflection is due south of the array on June 21<sup>st</sup>. Actual heights for points off due south will be higher than the value provided. Actual values were not calculated because the lowest possible heights (those experienced on June 21<sup>st</sup>) were much higher than the road and residences near the proposed project site.

- At 30 feet from the solar panels the height of the reflection is already at 35.8 feet.
- At 0.75 miles from the solar panels the height of the reflection equals 4,719 feet.
- At 1.0 miles from the solar panels the height of the reflection equals 6,294 feet.
- At 1.35 miles from the solar panels the height of the reflection equals 8,495 feet.
- At 1.43 miles from the solar panels the height of the reflection equals 8,998 feet.
- At 2.1 miles from the solar panels the height of the reflection equals 13,214 feet (or 2.5 miles). **Note:** The yellow dashed line (labeled aircraft flight path) shown on the figure runs parallel to Calipatria Airport's runway.

### Panels On a Single-axis Tracker

The proposed project may also feature panels mounted on single-axis polar trackers enabling the panels to rotate 45° off of due south. The single-axis tracker will widen the area of reflection, but no reflection will fall below the lowest angle of 50°. The visual below depicts this difference with the blue dashed lines representing the reflection from the panels mounted on the single-axis tracker and the orange dotted lines representing the panels at a set tilt.

Figure 7: Angle of reflection from different mounting systems.



## Reflection Coefficient of Trina Solar Modules (TSM-\*\*\*PC05)

Seller/Insurer: **Changzhou Trina Solar Energy Co., Ltd.**

To whom it may concern,

Trina Solar LTD hereby states that Reflection Coefficient of the glass of Trina Solar Modules (TSM-\*\*\*PC05) sold to your company complies with the data below:

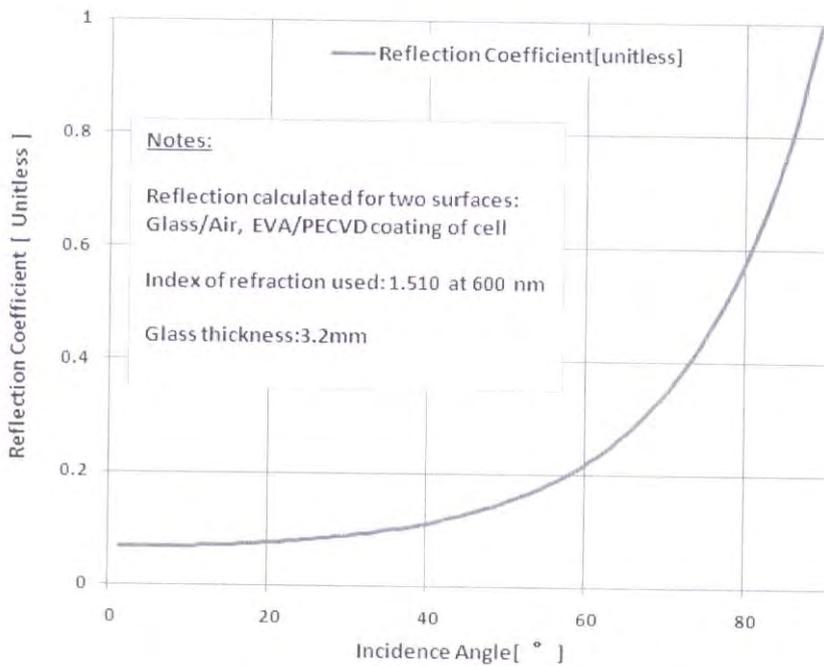
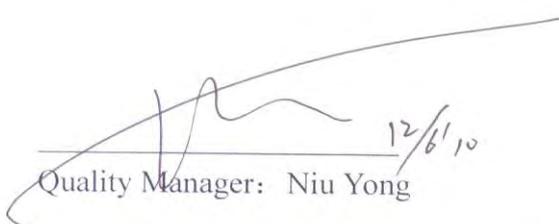
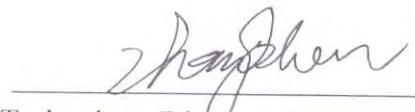
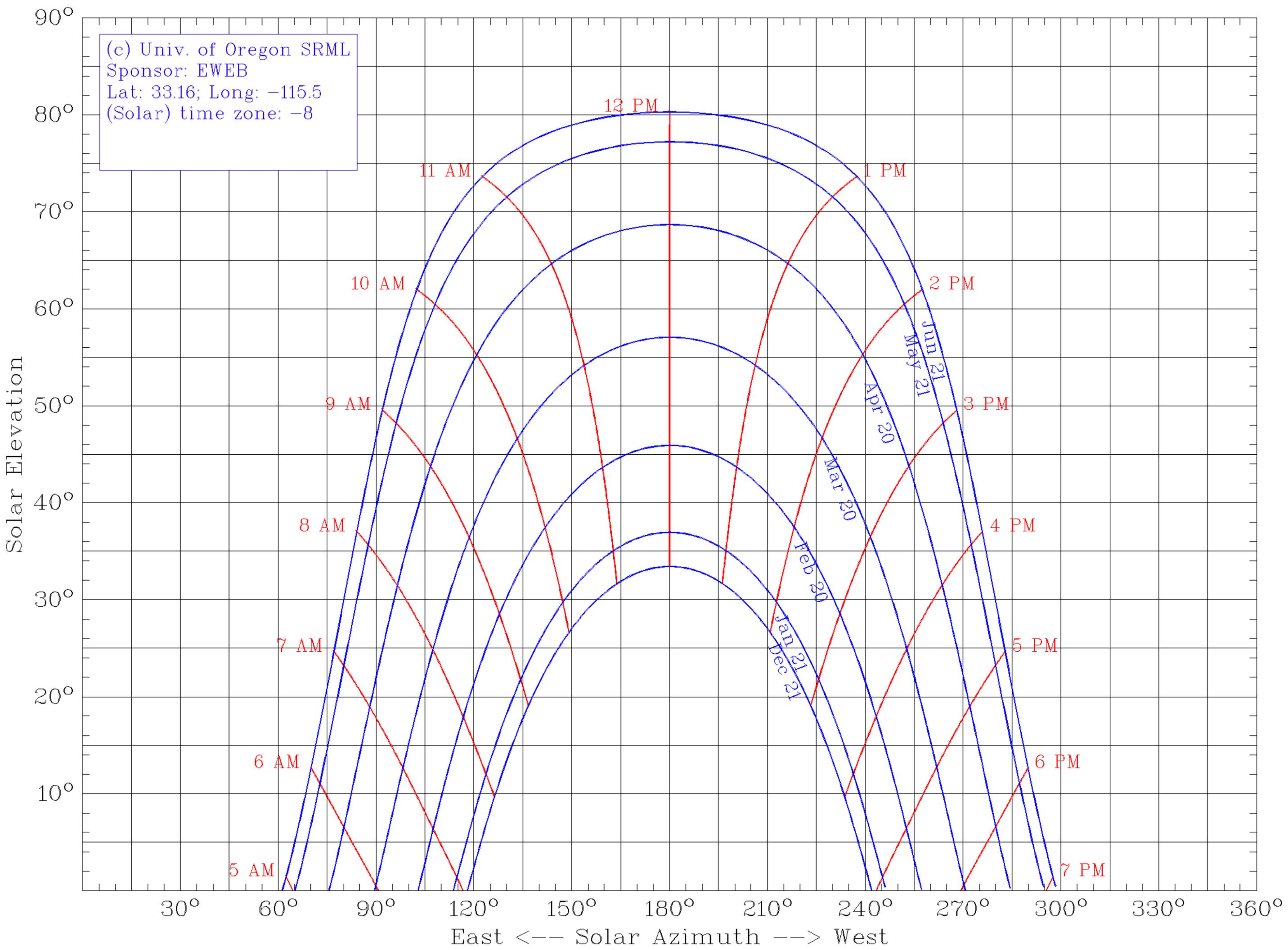


Fig 1 Reflection versus Angle of Incidence

  
Quality Manager: Niu Yong

  
Technology Director: Zhang Zhen

Changzhou Trina Solar Energy Co., Ltd.  
Changzhou, Jiangsu Province, China, 213031



## Potential Impacts from Reflection of Proposed Midway Solar Farm II (97 WI)

Draft Date: December 17, 2010

### KEY FINDINGS

- Based on the geometric configuration of the panels relative to the path of the sun and the inherently low reflectivity of flat-plate photovoltaic modules it is highly unlikely that the proposed projects will result in hazardous glare conditions. This is true regardless of the panel mounting system selected.
- Flat-plate photovoltaic solar panels are engineered to absorb, not reflect, sunlight. A panel with a single layer of anti-reflective coating reflects less than 10% of the sunlight striking it. By way of comparison, agriculture vegetation reflects between 18 and 25% of solar radiation.
- In order to maximize electricity production, panels are oriented toward the south and facing the sun, resulting in angles of reflection well above the built environment and nearby traffic corridors.

8minutenergy LLC asked Good Company, a sustainability research and consulting firm, to prepare a high-level analysis of the potential for hazardous glare conditions at the proposed Midway Solar Farm II project site located in Imperial County, California. The project site consists of two parcels of land (two tax lots) with a combined area of 803 acres. See Appendix A for aerial photographs of the site.

The proposed project is a 155-megawatt ground-mounted photovoltaic array that would make use of flat-plate, monocrystalline silicon photovoltaic modules. In conducting this reflection analysis, Good Company considered two design alternatives: 1) a south facing fixed-axis array and 2) a single-axis polar mounted array that partially tracks the path of the sun from east to west.

This analysis focuses on the direct glare impacts from the Midway Solar Farm II project on nearby traffic corridors and buildings.

### Reflectivity of Flat-plate Photovoltaic Solar Panels

Flat-plate photovoltaic solar panels are designed to absorb sunlight in order to convert it into electricity. Monocrystalline silicon wafers, the basic building block of most photovoltaic solar modules, absorb up to seventy percent of the Sun's solar radiation in the visible light spectrum.<sup>1</sup> Solar cells are typically encased in a transparent material referred to as an encapsulant and covered with a transparent cover film, commonly glass. The addition of these protective layers further reduces the amount of visible light reflected from photovoltaic modules. Photovoltaic (PV) panels use the absorbed energy in two ways; 1) the panels generate electricity, and 2) the mass of the panels heat up.

In order to maximize the efficiency of electricity production, photovoltaic manufacturers design their panels to minimize the amount of reflected sunlight. The most common methods to accomplish this are the application of anti-reflective coatings and surface texturing of solar cells. Combined, these techniques can reduce reflection losses to a few percent.<sup>2</sup> Most solar panels are now designed with at least one anti-reflective layer and some panels have multiple layers.

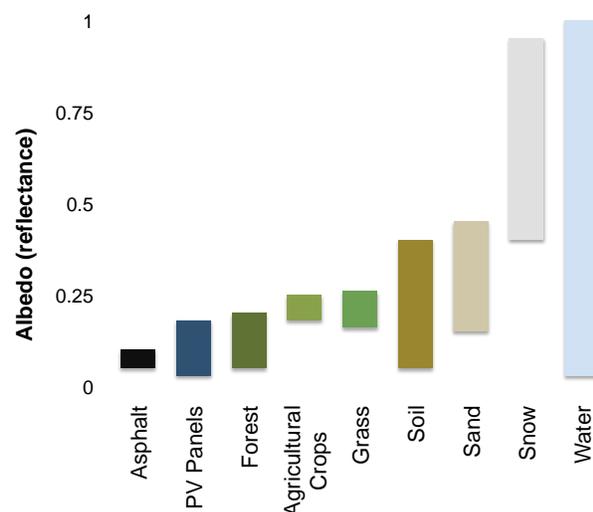
<sup>1</sup> Luque and Hegedus. 2003. *Handbook of Photovoltaic Science and Engineering*. Wiley and Sons, New Jersey.

<sup>2</sup> Ibid.

## Comparison of the Reflectivity of Solar Panel to the Surrounding Environment

One measure of the reflectivity is albedo, the ratio of solar radiation across the visible and invisible light spectrum reflected by a surface. Albedo varies between 0, a surface that reflects no light, and 1, a mirror-like surface that reflects all incoming light. Solar panels with a single anti-reflective coating have a reflectivity of around 0.1.<sup>3</sup> By comparison, sand has an albedo between .15 and .45 and agricultural vegetation has an albedo between .18 and .25.<sup>4</sup> In other words, the solar panels have a lower reflectivity than the area's prevailing ground cover, agricultural crops.

Figure 1: Albedo comparison for various surfaces.



## Visibility of a Direct Reflection of Sunlight for South Facing Fixed Mount Panels

In order to maximize electricity production, fixed (non-tracking) solar panels must be oriented toward the sun as much as possible. Per project specifications, this analysis assumes that the panels will face polar south at a tilt of 25 degrees above horizontal.

The position of the sun relative to the solar panels will vary by the time of day and time of year. As a result, the angle of direct reflection from the panels will also vary accordingly. The greatest likelihood of a low angle of direct reflection that might impact the built environment occurs midday on the summer solstice when the sun is at its highest point in the sky and the angle of reflection is lowest (see Figure 2 below). The potential impact at that moment is the best proxy for maximum impact overall.

During summer solstice at the proposed project's latitude, the sun's solar elevation is approximately 80 degrees.<sup>5</sup> With the sun at this height, the resulting angle of direct reflection is approximately 50 degrees above the horizon. It is highly unlikely that any objects in the built environment near the project site would be adversely affected by a direct reflection of sunlight from this angle, including vehicles traveling on nearby roads or buildings. Indeed, there are no structures of combined height and proximity to experience this direct reflection.

At a distance of only 20 feet (the approximate distance from the southern edge of the project to the center of W. Lindsey Rd.), the height of the reflected sunlight from the array would exceed 20 feet in elevation, well above the California truck height limit of 14 feet. It should be noted that W. Lindsey Rd. is not paved and therefore is not expected to support regular passenger or commercial traffic.

The nearest high-volume traffic corridor is Highway 111, which also runs north-south and is 0.5 miles due east of the project site. At a distance of half a mile the height of reflection exceeds 3,100 feet and for a distance of one mile the height is over 6,200 feet<sup>6</sup>—more than a third of a mile higher than Blue Angle Peak, the highest point in Imperial County.

<sup>3</sup> Lasnier and Ang. 1990. *Photovoltaic Engineering Handbook*. New York: Taylor & Francis.

<sup>4</sup> Budikova, Dagmar. 2010. "Albedo." *Encyclopedia of Earth*. Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment. Retrieved July 5, 2010 at <http://www.eoearth.org/article/Albedo>.

<sup>5</sup> Based on a Sun Path Chart produced using the University of Oregon Solar Radiation Monitoring Laboratory's Sun Chart software available on-line at <http://solardat.uoregon.edu/SunChartProgram.php> and assuming a latitude of 33.16 degrees north. A copy of the chart is attached at the end of this document.

<sup>6</sup> This height is more than double the height of Burj Khalifa in Dubai, currently the tallest building in the world at just over 2,700 feet.

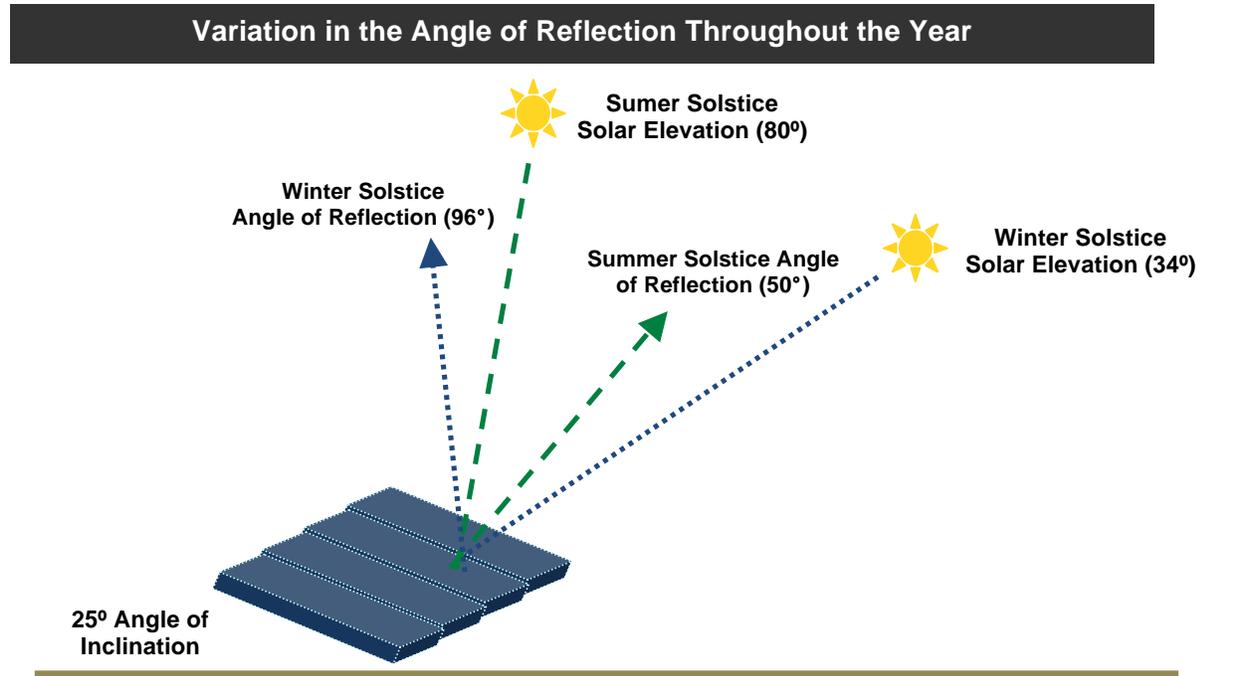
The nearest built structure to the site is a group of residences and a storage yard on the southwest corner of Solar Farm II. The building that would be closest to the array is on the north side of the campus approximately 60 feet from the parameter of the proposed solar array. At this distance, the elevation of direct glare would exceed 69 feet, the height of a 4-story building<sup>7</sup>. Additionally, the project developer has proposed to construct an 8-foot slatted fence around the perimeter of the project further obscuring the peripheral view of the project (and any indirect reflection).

The Calipatria Municipal Airport is 1.3 miles to the southeast of the proposed location for the Midway Solar Farm II project. Aircraft using the west end of the runway would pass due south of the facility at a distance of ~1.1 miles. At this distance, direct reflection would have a height of over 6,600 feet. This elevation represents the lowest point of direct reflection due south of the array at a distance perpendicular to the flight path of aircrafts approaching and departing Calipatria Municipal Airport.<sup>8</sup>

It is possible that aircraft may experience momentary direct or indirect reflection from the array at Midway Solar Farm II. These occurrences are dependent on a number of factors including time of year, time of day, altitude, aircraft relationship to the array, etc. With that said, the albedo (measure of reflectance) of the PV modules is lower than other common surfaces in the surrounding area, including agricultural vegetation. In addition, large-scale solar projects have been installed at or near major airports (e.g. a 750 kW array at Oakland International Airport) without incident or serious complaints.<sup>9</sup>

During the winter months, when the sun travels across the sky at lower angles relative to the horizon, the angle of reflection and the resulting height of the reflected sunlight are higher. At midday on the winter solstice at the proposed project's latitude, the sun's solar elevation is approximately 34 degrees. At this angle of elevation, the resulting angle of reflection is 96 degrees. At this angle, the height of the reflected sunlight would exceed 190 feet in elevation at a distance of only 20 feet away and the further away from the array the greater the height of the reflected sunlight.

**Figure 2:** The range of the sun's angle-of-reflection depending on the time of year.



<sup>7</sup> This number of floors assumes a height of 15 feet per floor.

<sup>8</sup> Details about typical aircraft traffic patterns, frequency of use and operating elevations were not available for this analysis.

<sup>9</sup> Federal Aviation Administration. 2010. *Technical Guidance for Evaluating Selected Solar Technologies on Airports*. Page 41. Online at [http://www.faa.gov/airports/environmental/policy\\_guidance/media/airport\\_solar\\_guide\\_print.pdf](http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide_print.pdf).

### **Visibility of an Indirect Reflection of Sunlight**

While this analysis focuses on direct reflection in theory, we must also consider the potential for indirect reflections (the visibility of diffused sunlight on the surface of the panels). As with the potential for direct reflections, indirect reflections are not a significant concern.<sup>10</sup> Indirect reflections are by definition significantly less intense— for example, moving just 30 degree off a direct reflection lowers light intensity by nearly 80% percent.<sup>11</sup> While at certain times of the day an observer would have a view of an indirect reflection, the relative intensity of the reflection would not be significant or a concern. Additionally, the project developer has proposed to construct an 8-foot slatted fence around the perimeter of the project further obscuring the peripheral view of the project (and any indirect reflection).

### **Comparison of Fixed Mount and Single-axis Tracking Mount on Direct Solar Reflection**

Like the fixed-axis array configuration, the panels of a single-axis tracking array would also have an angle of inclination of approximately 25 degrees. Since this angle of inclination remains constant between the two configurations, the lowest potential angle of reflection remains the same. As with a fixed-axis array, the greatest potential for a low angle of reflection to impact the built environment occurs at midday on the summer solstice when the sun is at its highest point in the sky.

The key difference between a fixed-axis and single-axis tracking configuration is the cardinal direction of reflected sunlight. At midday on the summer solstice, the time of year most likely to produce a low angle of reflection, both configurations would be facing south and reflect light back in the same direction. At other times of the year the angles of reflection would be higher and as such, the height of direct reflection would increase compared to the height during summer solstice.

---

<sup>10</sup> A number of other studies conducted for proposed solar projects have sought to quantify the potential for the diffuse reflection of sunlight from the surface of solar panels and reached similar conclusions. For additional information see “Panoche Valley Solar Farm Project Glint and Glare Study” ([www.panochesolar.info/app/jun2010/Glint\\_Glare\\_Study.pdf](http://www.panochesolar.info/app/jun2010/Glint_Glare_Study.pdf)) and “Topaz Solar Farm Reflection Study” (<http://www.slcounty.ca.gov/Assets/PL/Optisolar-Topaz+Solar+Farm/Documents/Application+Submittal+232/Attachment+C++Topaz+Solar+Farm+Reflection+Study.pdf>).

<sup>11</sup> TrinaSolar. “Reflection Coefficient of Trina Solar Modules.” Personal communication with Thomas Houghton, June 30, 2010.

## Appendix A: Glare Analysis Explanation

### Angle of Direct Reflection Off Panels

According to the sun path diagram charting the sun's movement at the proposed project's latitude, the sun is shining at its highest point at 12:00 PM on the summer solstice (June 21).<sup>12</sup> At this point the sun is shining at an 80-degree angle directly upon the south facing solar panels. This analysis assumes that the panels will face polar south at a tilt of 25 degrees above horizontal.

Figure 3 to the right depicts this reflection. All angles within a triangle summed equal 180°. From this rule it is simple algebra to obtain that **z** equals 75°. Because **a** and **z** are vertical angles, **a** also equals 75°. Once **b** is calculated (a flat plane also equals 180° so subtracting **180° - 2a** equals **b**) the calculation of the angle of the sun's reflection is easy to complete using the same formula (**180° - (z + x) - 25°**).

Figure 3: Angle of direct reflection on summer solstice (June 21).

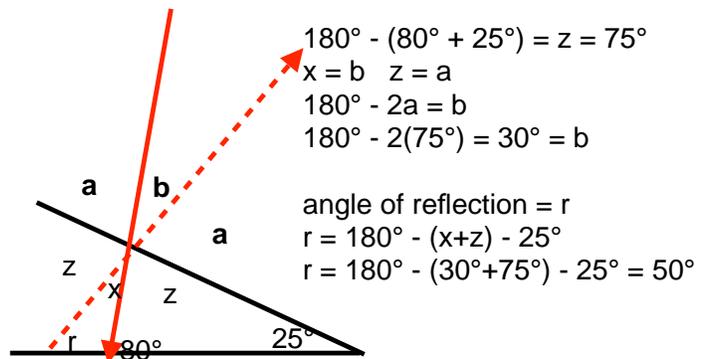
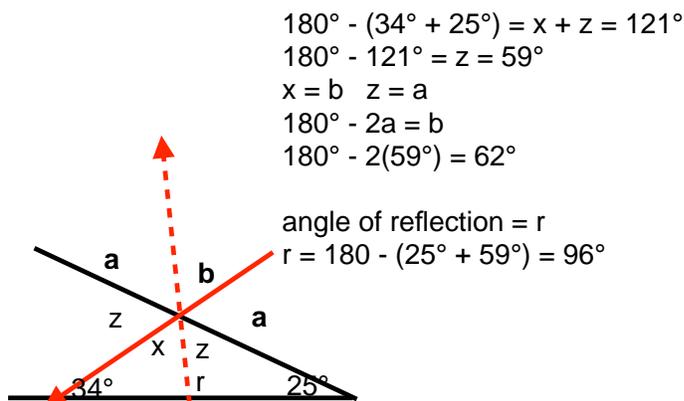


Figure 4: Angle of direct reflection on winter solstice (Dec. 21).



The angle of the sun's reflection is 50°.

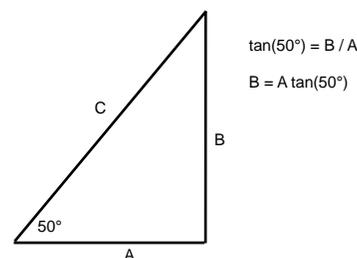
Similar calculations are performed to determine the angle of the sun's reflection when the sun hits the solar panels at a low point during winter solstice on December 21st (see Figure 4, a 34-degree angle). From determining that **x** plus **z** equals 121° (**180° - 34° - 25°**) and looking at the vertical angles (**x = b**) and (**z = a**), it is then possible to calculate that the angle of the sun's reflection is 96° (**r = 180° - z - 25°**).

### Determining the Height of Reflection

Given the preliminary project plans provided, the solar panels do not cause a direct glare on the built environment and nearby traffic corridors.

The lowest potential reflection angle, determined to be 50°, was used to estimate the height of the sun's reflection. Trigonometry calculations are used to project the height of the reflection. It is important to point out that there are no notable elevation rises surrounding the sited Midway Solar Farm II project.

Figure 5: Calculation to determine direct reflection.



<sup>12</sup> Based on a Sun Path Chart produced using the University of Oregon Solar Radiation Monitoring Laboratory's Sun Chart software available on-line at <http://solar.dat.uoregon.edu/SunChartProgram.php> and assuming a latitude of 33.16 degrees north.

Figure 5 shows the basic calculations to determine the height of the sun's reflection. In the visual, A is representative of the horizontal distance. Any distance measurement can be input into the formula to find B, which represents the height of the sun's reflection at the distance input.

The picture of the sited Midway Solar Farm II project from Google Earth (Figure 6) has overlaying lines to show clearly where the roads regularly used are located (yellow-dashed lines). The picture also notates how far these roads are from the slated site and potential glare of the panels (blue lines).

**Figure 6:** Aerial image of the Midway Solar Farm II project site.

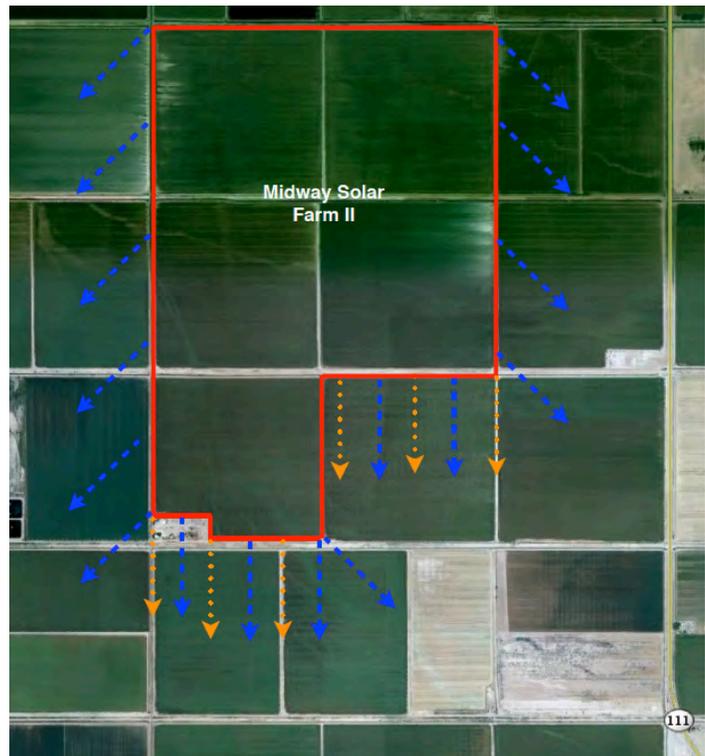


- At 20 feet from the solar panels the height of the reflection is already at 24 feet.
- At 60 feet from the solar panels the height of the reflection is already at 72 feet.
- At 0.6 miles from the solar panels the height of the reflection equals 3,776 feet.
- At 0.7 miles from the solar panels the height of the reflection equals 4,405 feet.
- At 1.1 miles from the solar panels the height of the reflection equals 6,921 feet (or 1.3 miles).

### Panels On a Single-axis Tracker

The proposed project may also feature panels mounted on single-axis polar trackers enabling the panels to rotate 45° off of due south. The single-axis tracker will widen the area of reflection, but no reflection will fall below the lowest angle of 50°. The visual below depicts this difference with the blue dashed lines representing the reflection from the panels mounted on the single-axis tracker and the orange dotted lines representing the panels at a set tilt.

Figure 7: Angle of reflection from different mounting systems.



## Reflection Coefficient of Trina Solar Modules (TSM-\*\*\*PC05)

Seller/Insurer: **Changzhou Trina Solar Energy Co., Ltd.**

To whom it may concern,

Trina Solar LTD hereby states that Reflection Coefficient of the glass of Trina Solar Modules (TSM-\*\*\*PC05) sold to your company complies with the data below:

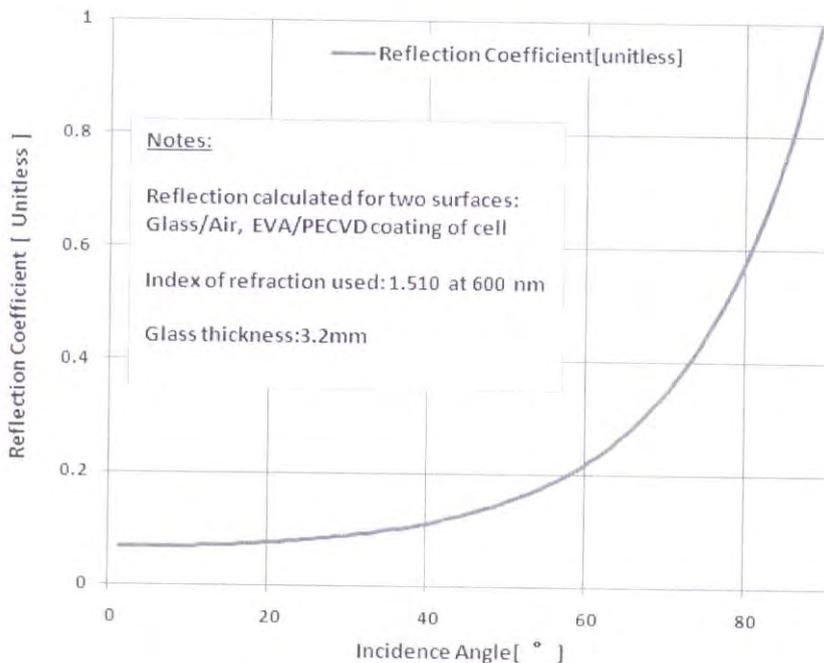
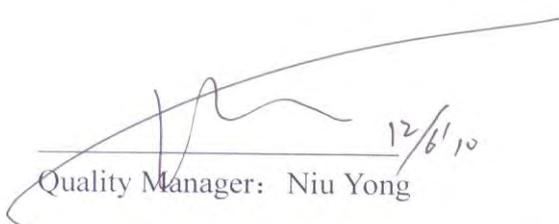
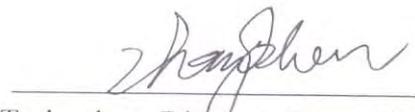


Fig 1 Reflection versus Angle of Incidence

  
Quality Manager: Niu Yong

  
Technology Director: Zhang Zhen

Changzhou Trina Solar Energy Co., Ltd.  
Changzhou, Jiangsu Province, China, 213031

