POWER ENGINEERS, INC.

2041 SOUTH COBALT POINT WAY
MERIDIAN, ID 83642 USA

PHONE 208-288-6100
FAX 208-288-6199

POWER ENGINEERS

ENERGY
FACILITIES
COMMUNICATIONS
ENVIRONMENTAL

October 7, 2014

Patrick Brown
Soitec Solar Inc
16550 Via Esprillo
San Diego, CA 92127

Subject: 129799 Evaluating Potential Glare from CPV Trackers in Horizontal "Stow" Position

Dear Patrick:

POWER Engineers, Inc. (POWER) has been asked by the county of San Diego to respond to comments on the Draft Programmatic Environmental Impact Report (DPEIR) regarding potential glare impacts from the Proposed Project during wind-triggered horizontal stow procedures. Glare attributed to horizontal stow procedures includes potential glare impacts during operations to move the CPV trackers into and out of stow position and while CPV trackers remain in horizontal stow position.

POWER has based its conclusions on data collected at a meteorological weather station (MET station) owned and monitored by Soitec. The MET station is located proximate to the proposed Rugged Solar Farm, and has been in place since August 2012. POWER based its analysis on weather data collected from January 1 through December 31, 2013.

POWER's response is as follows:

The wind speed and duration at which a tracker would be directed to go into "stow" mode is 17.5 meters per second (m/s) (approximately 39 miles per hour (mph)) for longer than 3 seconds. It takes approximately 10 minutes for a CPV tracker to move into horizontal stow position, and 10 minutes for a CPV tracker to move back into operational mode. Once a stow operation is initiated by a wind detected at or above 17.5 m/s for 3 seconds or longer, a 10-minute clock begins. If wind conditions do not exceed 17.5 m/s for longer than 3 seconds within that 10-minute period, then the trackers will revert back to operational mode. If, however, the wind speed exceeds 17.5 m/s within the 10-minute period, then the 10-minute clock is reset and tracker remains in stow mode.

For example, if the wind exceeds 17.5 m/s for 3 seconds only once, then the total time the trackers would be in stow mode would be 20 minutes—10 minutes moving to stow and 10 minutes moving back to operational mode.

If, however, the wind again exceeds 17.5 m/s for 3 seconds 9 minutes after the first exceedance, the 10-minute clock would be reset. If 10 minutes passes without any exceedance, then the trackers would be returned to operational mode. Under this scenario, the total time the trackers would be in stow mode would be 29 minutes (10 minutes moving to stow mode + 9 minutes in horizontal stow position + 10 minutes moving back to operational mode).

Based on data from the MET station for January to December 2013, Soitec trackers would have gone into stow mode for a total of approximately 1,938 minutes, of which approximately 758 minutes would have occurred during daylight hours. In a given year, there are approximately 3,980 daylight hours (or 238,800 daylight minutes) when Soitec trackers could be operating (Exhibit 1, Calculating the Duration of Concentrator Photovoltaic Stow Operations Based on Meteorological Data in Boulevard in 2013). Accordingly, in 2013 wind conditions during daylight hours would have triggered Soitec trackers to be in stow mode approximately 0.32% of the time, meaning wind conditions would have enabled trackers to be operating 99.68% of the time.

The majority of stow mode events would have lasted no more than 20 minutes, and almost all stow mode events would have lasted no longer than an hour. The longest single stow mode event would have lasted approximately 209 minutes.

Whether and where a particular glare impact may occur when Soitec's trackers go into "stow" mode depends on a variety of factors, including the position of the sun in the sky, the orientation of the tracker relative to the sun, and weather conditions at the time (i.e., cloud cover or ambient dust in the air both would reduce incidence of glare). Unlike POWER's ability to calculate potential glare impacts in the Boulevard Glare Study by using computer simulation with 3D geometric analysis and well-recognized solar movement patterns (see DPEIR, Appendix 2.1-3), it is rather difficult and speculative to predict weather conditions, the position of the sun, or the orientation of the trackers at the time when wind conditions may trigger a shift to stow mode.

The CEQA Guidelines recognize that in some circumstances, foreseeing the unforeseeable is not possible. CEQA Guidelines § 15144. In such circumstances, the CEQA Guidelines direct that if a "Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact." CEQA Guidelines § 15145.

Based on the unpredictability and infrequency of Soitec trackers being moved into stow mode during daylight operating hours (only 0.32% of the time), it is POWER's professional opinion that it is not possible to predict when and where glare attributed to wind stow procedures would result in potential impacts. Further, it is POWER's professional opinion that any attempt to do so would be purely speculative, and any glare generated by CPV trackers in stow mode would result in an overall low occurrence for glare impacts to offsite viewers.

It is also POWER's professional opinion that any additional glare would not change the degree of significant impact to offsite viewers associated with glare impacts disclosed in the DPEIR for the Tierra del Sol, Rugged, LanEast and LanWest Solar Farms individually, or the Proposed Project as a whole, because it would not result in a substantial increase in the severity of previously acknowledged glare impacts.

Please contact me at 509-758-6029 or by email at jason.pfaff@powereng.com if you have questions.

Sincerely,

Jason Pfaff
Visual Resources Manager

c: WSBC - 06
Andy Stephens, POWER

Exhibit 1

Calculating the Duration of Concentrator Photovoltaic Stow Operations Based On Meteorological Data in Boulevard in 2013

Table 1. Stow Duration for CPV Panels During Daylight Wind Events in 2013

Stow duration per event (minutes)	Number of events	%	Total Stow Duration (minutes)
20	9	47%	180
21	2	11%	42
22	1	5%	22
24	1	5%	24
32	1	5%	32
36	1	5%	36
38	1	5%	38
44	1	5%	44
131	1	5%	131
209	1	5%	209
	19		**758**

Table 2. Stow Duration for CPV Panels During All Wind Events in 2013

Stow duration (minutes)	Number of events	%	Total Stow Duration (minutes)
20	24	47%	480
21	3	6%	63
22	1	2%	22
24	2	4%	48
26	1	2%	26
30	1	2%	30
32	1	2%	32
35	1	2%	35
36	2	4%	72
37	1	2%	37
38	2	4%	76
41	1	2%	41
42	1	2%	42
44	1	2%	44
47	1	2%	47
53	1	2%	53
61	1	2%	61
64	1	2%	64
67	1	2%	67
92	1	2%	92

Stow duration (minutes)	Number of events	%	Total Stow Duration (minutes)
131	1	2%	131
166	1	2%	166
209	1	2%	209
	51		**1,938**

Table 3. Percentage of Daylight Minutes CPV Trackers Would Be in Stow

Daylight in Year (minutes)	Total Daylight Stow (minutes)	%
238,800	758	0.0032