



Mt. SAC Glare Analysis

7/3/2017

This analysis looks at the potential glare impact from the latest Borrego tracking solar system at Mt. SAC. This analysis is based on the Solar Glare Hazard Analysis Tool (SGHAT) from Sandia National Labs¹. This analysis does not consider physical obstructions between the solar system and the observation point. Buildings, tree coverage, and geographical obstructions may minimize any glare impact found.

Summary

No harmful glare was found in this analysis. The SGHAT indicates no risk for glare for all 8 observation points investigated.

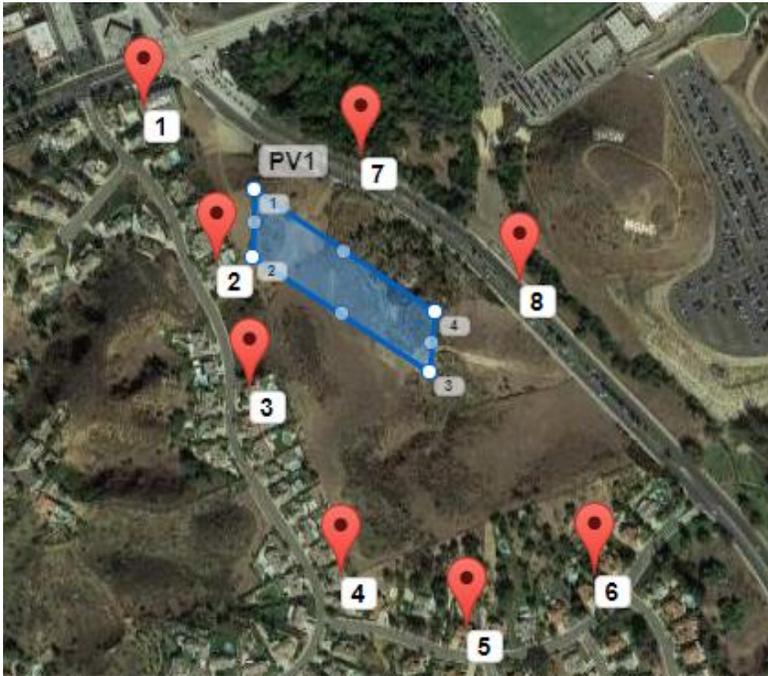
The modeled system is for a south facing single axis solar PV system with backtracking. The PV system is at 760ft elevation and a panel height of 4ft off the ground.

If the system was a fixed system, there would be glare in the homes to the west (observation points 2 and 3) in the early mornings. Additionally, if the PV system did not have backtracking, there may be minimal glare concerns in the homes to the west (observation points 2 and 3) in the early evening. However, it is important to note that even if there was glare, this type of glare is non-harmful and represent glare similar to light reflecting off a car windshield. There are also post construction means and methods that can be used to prevent the glare. For example, trees can be planted around the solar PV system to mitigate the glare by removing the line of sight to the any affected homes.

¹ Sandia National Laboratories. Solar Glare Hazard Analysis Tool. <https://share.sandia.gov/phlux/sghat/>

Input Parameters

Site – the glare impact in this analysis was evaluated at these 8 sites for this PV array layout



PV Array – the PV array is single tracking with zero tilt and other specs listed here

PV Array

Array name
Mt SAC PV Array

Description

Axis tracking: Single

Module surface material: Light textured glass without ARC

Tilt of tracking axis: 0 deg

Orientation of tracking axis: 180 deg

Offset angle of module: 0 deg

Slope error: 10 mrad

Limit the rotation angle?

Maximum tracking angle: 60 deg

Rated power: 1972.8 kW

Reflectivity varies with incidence angle (view data)

Correlate slope error to module surface type (view data)

Orientation of tracking axis: 180 deg

The panels are assumed to be constructed facing south completely and track the sun from east to west.

Maximum tracking angle: 60 deg

The tracking systems tilt in the early morning and evening to further reduce the possibility of glare. The practice of limiting tracking angles is common in the industry and is known as “backtracking”. Backtracking allows solar rows to be placed closer together while sacrificing minimal production capacity. An angle of 60 degrees is a conservative estimate for maximum tracking angle as with backtracking.

PV Elevation – the panels were assumed to be built at ground elevation of 760 and 4 feet panel height

Vertices [click to expand/collapse](#)

id	Latitude	Longitude	Ground Elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	34.04169	-117.84683	760	4	764
2	34.04103	-117.84684	760	4	764
3	34.03991	-117.84477	760	4	764
4	34.04049	-117.8447	760	4	764

Observation Points – here are the specs on the observation points in this analysis

It is important to note that the SGHAT analysis looks at the topography to determine the line of sight and visibility. This would not include trees or buildings that currently prevent any sight lines. So it can be assumed that if the observed cannot see the proposed PV solar system location due to obstructions, there would be no glare even if SGHAT reports glare since it doesn't take the obstructions into consideration.

Solo Observation Point(s)					Saving	▼
name	latitude	longitude	ground elevation	Eye-level height above ground		
	deg	deg	ft	ft		
1	34.04247	-117.84814	742.07	6	<input type="checkbox"/>	<input type="checkbox"/>
2	34.04096	-117.84728	791.21	6	<input type="checkbox"/>	<input type="checkbox"/>
3	34.03973	-117.8469	795.91	6	<input type="checkbox"/>	<input type="checkbox"/>
4	34.03792	-117.84582	805.71	6	<input type="checkbox"/>	<input type="checkbox"/>
5	34.0374	-117.84434	783.36	6	<input type="checkbox"/>	<input type="checkbox"/>
6	34.03794	-117.84284	718.84	6	<input type="checkbox"/>	<input type="checkbox"/>
7	34.04201	-117.84559	722.54	0	<input type="checkbox"/>	<input type="checkbox"/>
8	34.04076	-117.84372	696.68	0	<input type="checkbox"/>	<input type="checkbox"/>

Results

There is no glare found in any of the 8 observation points.

- Summary
- OP: 1
- OP: 2
- OP: 3
- OP: 4
- OP: 5
- OP: 6
- OP: 7
- OP: 8

Observation	status
OP: 1	No glare
OP: 2	No glare
OP: 3	No glare
OP: 4	No glare
OP: 5	No glare
OP: 6	No glare
OP: 7	No glare
OP: 8	No glare