

SUNPOWER®

*Informational Memo
Reid-Hillview Airport – FAA Glare Study
December 1, 2017*

To whom it may concern,

The attached Solar Glare Hazard Analysis Tool Reports from February of 2015 were generated based upon the same design that was ultimately permitted and constructed at the Reid-Hillview Airport. This design consists of 1,044kW of SunPower solar modules installed on an Oasis 2.0 single-axis tracker immediately to the southwest of the airport runways. In accordance with FAA guidelines the Sandia Solar Glare Hazard Analysis Tool was run three times, considering vantage points from two different flight paths as well as from the air traffic control tower.

These reports were reviewed by the FAA. On May 27th, 2015 SunPower received a letter from the FAA providing the Final Determination of no objection to the construction described in SunPower's proposal. SunPower's proposal was found to be in compliance with FAA Advisory Circular 150/5370-2, "Operation Safety on Airports During Construction."

Kind Regards,



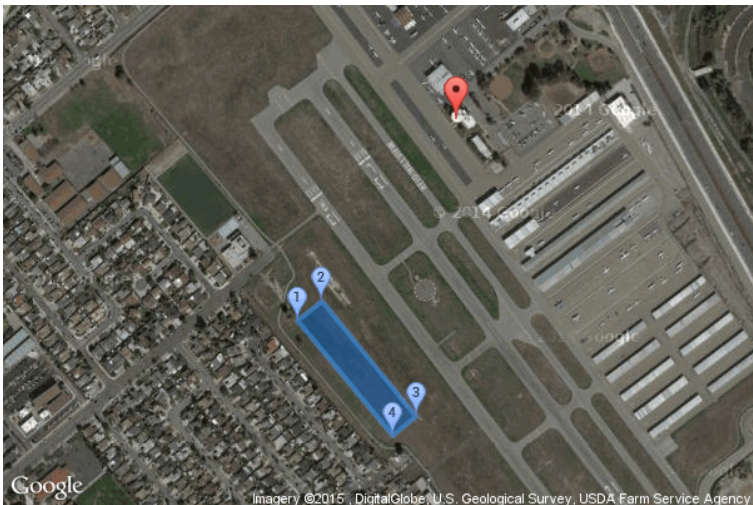
William Ray Yeager, PE
Manager, Commercial Project Design & Engineering

Solar Glare Hazard Analysis Report

Generated Feb. 19, 2015, 3:19 p.m.

No glare found

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Inputs

Analysis name	Reid Hillview Airport
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	140.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True

Maximum tracking angle (deg)	45.0
Rated power (kW)	1044.0
Vary reflectivity	True
PV surface material	Light textured glass with ARC

Timezone offset	-8.0
Subtended angle of sun (mrad)	9.3
Peak DNI (W/m ²)	1000.0
Ocular transmission coefficient	0.5
Pupil diameter (m)	0.002
Eye focal length (m)	0.017
Time interval (min)	1
Slope error (mrad)	2.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	37.3332356902	-121.822741628	124.01	6.0	130.01
2	37.3335007487	-121.822317839	124.92	6.0	130.92
3	37.3319315118	-121.820708513	124.16	6.0	130.16
4	37.3316670541	-121.82110548	126.7	6.0	132.7

Observation Points

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	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)
ATCT	37.3359710762	-121.820005179	128.88	20.0

No glare found.

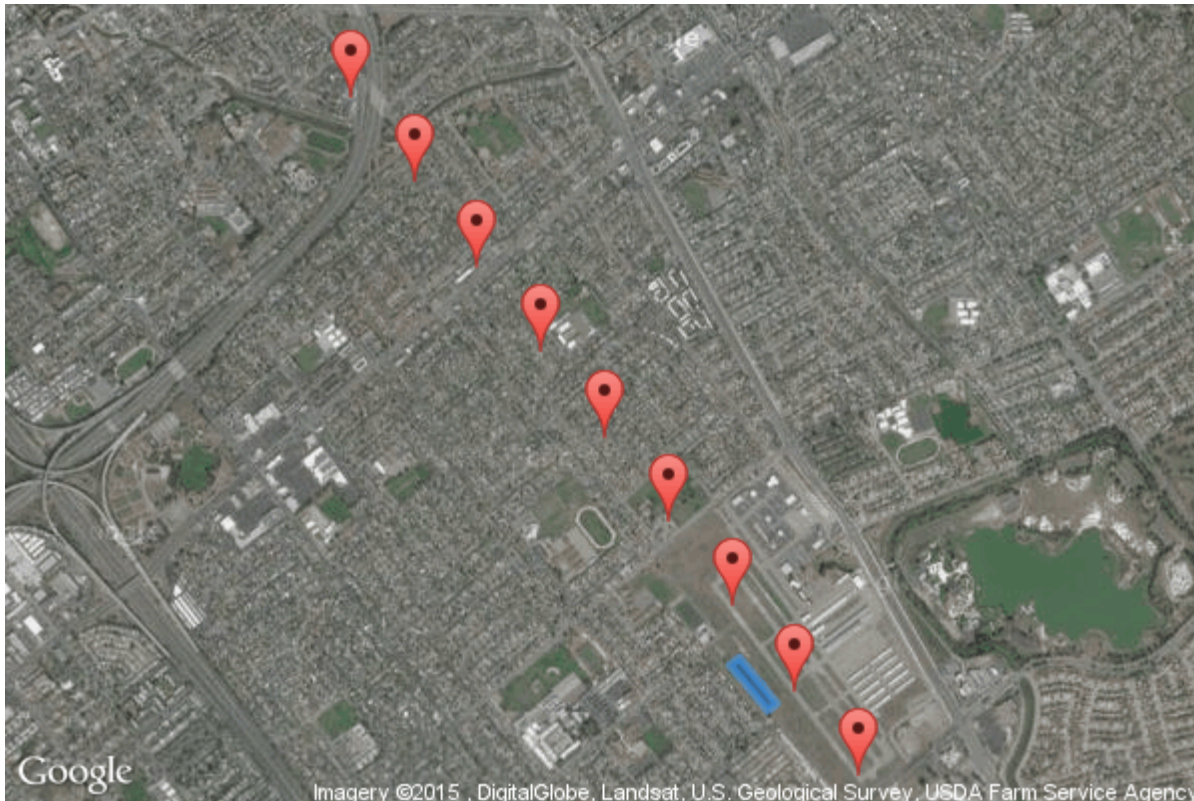
Solar Glare Hazard Analysis Flight Path Report

Generated Feb. 19, 2015, 3:21 p.m.

Flight path: 1

No glare found

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Analysis & PV array parameters

Analysis name	Reid Hillview Airport
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	140.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	45.0
Rated power (kW)	1044.0
Vary reflectivity	True
PV surface material	Light textured glass with ARC

Timezone offset	-8.0
Subtended angle of sun (mrad)	9.3
Peak DNI (W/m ²)	1000.0
Ocular transmission coefficient	0.5
Pupil diameter (m)	0.002
Eye focal length (m)	0.017
Time interval (min)	1
Slope error (mrad)	2.0

Flight path parameters

Direction (deg)	143.15
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Glide slope (deg)	3.0
Consider pilot visibility from cockpit	True
Max downward viewing angle (deg)	30.0
Azimuthal viewing angle (deg)	180.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	37.3332356902	-121.822741628	124.01	6.0	130.01
2	37.3335007487	-121.822317839	124.92	6.0	130.92
3	37.3319315118	-121.820708513	124.16	6.0	130.16
4	37.3316670541	-121.82110548	126.7	6.0	132.7

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	37.3294177052	-121.81716919	133.68	50.0	No
1/4 mi	37.3323094529	-121.819897913	127.44	125.41	No
1/2 mi	37.3352012005	-121.822626636	123.71	198.33	No
3/4 mi	37.3380929482	-121.825355358	122.3	268.91	No
1 mi	37.3409846958	-121.828084081	118.59	341.79	No
1 1/4 mi	37.3438764435	-121.830812804	115.21	414.36	No
1 1/2 mi	37.3467681911	-121.833541526	111.93	486.81	No
1 3/4 mi	37.3496599388	-121.836270249	104.89	563.04	No
2 mi	37.3525516864	-121.838998972	107.89	629.21	No

No glare found.

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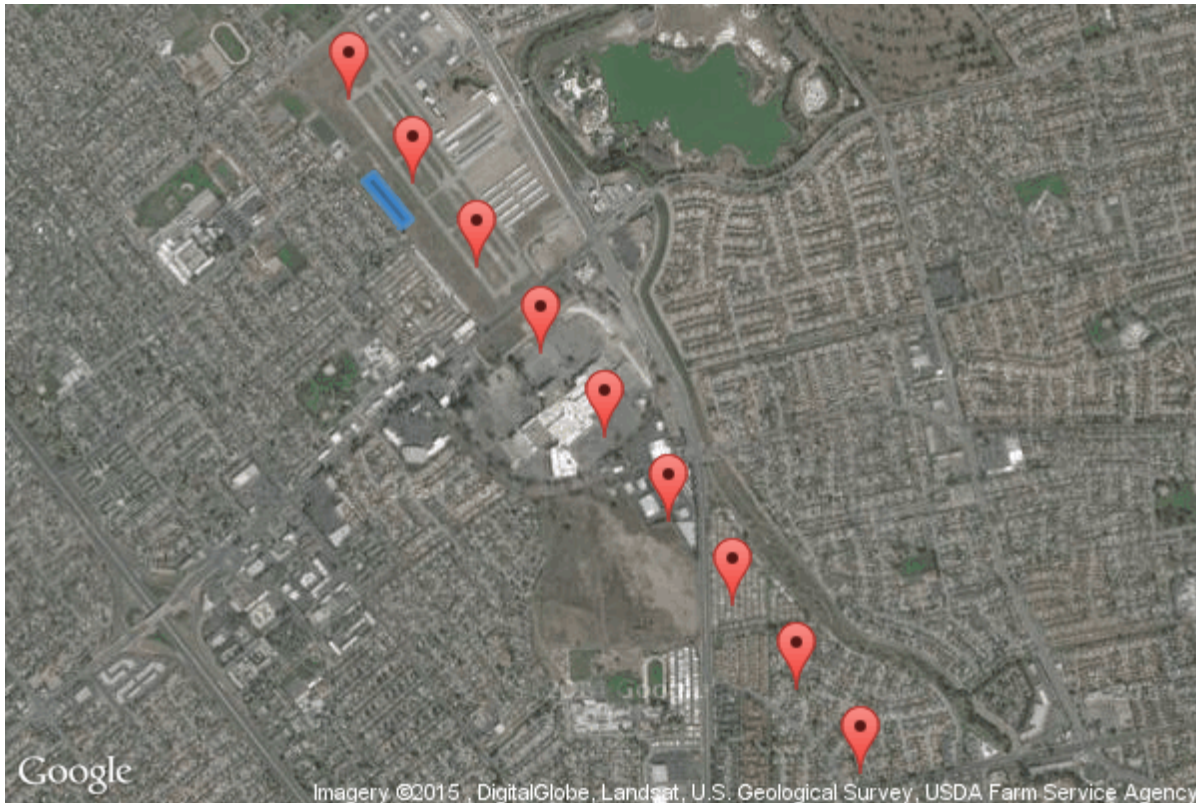
Solar Glare Hazard Analysis Flight Path Report

Generated Feb. 19, 2015, 3:22 p.m.

Flight path: 2

No glare found

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Analysis & PV array parameters

Analysis name	Reid Hillview Airport
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	140.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	45.0
Rated power (kW)	1044.0
Vary reflectivity	True
PV surface material	Light textured glass with ARC

Timezone offset	-8.0
Subtended angle of sun (mrad)	9.3
Peak DNI (W/m ²)	1000.0
Ocular transmission coefficient	0.5
Pupil diameter (m)	0.002
Eye focal length (m)	0.017
Time interval (min)	1
Slope error (mrad)	2.0

Flight path parameters

Direction (deg)	322.81
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Glide slope (deg)	3.0
Consider pilot visibility from cockpit	True
Max downward viewing angle (deg)	30.0
Azimuthal viewing angle (deg)	180.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	37.3332356902	-121.822741628	124.01	6.0	130.01
2	37.3335007487	-121.822317839	124.92	6.0	130.92
3	37.3319315118	-121.820708513	124.16	6.0	130.16
4	37.3316670541	-121.82110548	126.7	6.0	132.7

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	37.3359721973	-121.823396683	123.12	50.0	No
1/4 mi	37.3330933612	-121.820646163	126.06	116.24	No
1/2 mi	37.330214525	-121.817895643	130.58	180.9	No
3/4 mi	37.3273356889	-121.815145123	134.16	246.5	No
1 mi	37.3244568528	-121.812394603	133.58	316.25	No
1 1/4 mi	37.3215780166	-121.809644082	142.62	376.4	No
1 1/2 mi	37.3186991805	-121.806893562	150.77	437.42	No
1 3/4 mi	37.3158203443	-121.804143042	166.18	491.2	No
2 mi	37.3129415082	-121.801392522	183.03	543.52	No

No glare found.

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U.S. Department of Transportation

Federal Aviation Administration

May 27, 2015

TO:
SunPower Corporation, Systems
Attn: William Ray Yeager
1414 Harbour Way South
Richmond, CA 94804
wyeager@sunpower.com

RE: (See attached Table 1 for referenced case(s))
FINAL DETERMINATION

Table 1 - Letter Referenced Case(s)

ASN	Prior ASN	Location	Latitude (NAD83)	Longitude (NAD83)	AGL (Feet)	AMSL (Feet)
2015-AWP-231-NRA		SAN JOSE, CA	37-19-58.97N	121-49-19.47W	8	132

Description: Low-profile, ground mounted, sun tracking solar photovoltaic array to be installed adjacent to runway in field on southwest side of Reid-Hillview airport. Electrical infrastructure will be underground and will connect to existing underground PG&E circuit. Array will be surrounded by fence and will include no additional lighting beyond what may be required by established marking and lighting standards.

We do not object to the construction described in this proposal provided:

You comply with the requirements set forth in FAA Advisory Circular 150/5370-2, "Operational Safety on Airports During Construction."

This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, and the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

When your Airport Layout Plan is updated, please include this new development. In the meantime, we will show this feature on your current ALP approved on September 11, 2008.

This determination expires on November 27, 2016 unless:

(a) extended, revised or terminated by the issuing office.

(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for the completion of construction, or the date the FCC denies the application.

NOTE: Request for extension of the effective period of this determination must be obtained at least 15 days prior to expiration date specified in this letter.

If you have any questions concerning this determination contact Abel Tapia (650) 827-7621
Abel.Tapia@faa.gov.

Abel Tapia
DivUser