



FORGESOLAR GLARE ANALYSIS

Project: **Biggs Ford Solar Center**

Site configuration: **Biggs Ford Solar Center**

Analysis conducted by Tyler Cline (tcline@coronalenergy.com) at 11:54 on 31 Aug, 2018.

U.S. FAA 2013 Policy Adherence

The following table summarizes the policy adherence of the glare analysis based on the 2013 U.S. Federal Aviation Administration Interim Policy 78 FR 63276. This policy requires the following criteria be met for solar energy systems on airport property:

- No "yellow" glare (potential for after-image) for any flight path from threshold to 2 miles
- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics (see list below)

ForgeSolar does not represent or speak officially for the FAA and cannot approve or deny projects. Results are informational only.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
Flight path(s)	N/A	No flight paths analyzed
ATCT(s)	N/A	No ATCT receptors designated

Default glare analysis and observer eye characteristics are as follows:

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at <https://www.federalregister.gov/d/2013-24729>

SITE CONFIGURATION

Analysis Parameters

DNI: peaks at 1,000.0 W/m²
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 20768.3528



PV Array(s)

Name: PV array 1
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.485810	-77.381007	293.19	0.00	293.19
2	39.481827	-77.380717	296.42	0.00	296.42
3	39.480112	-77.380150	305.54	0.00	305.54
4	39.480227	-77.379485	303.74	0.00	303.74
5	39.479797	-77.378948	304.61	0.00	304.61
6	39.481569	-77.371245	286.47	0.00	286.47
7	39.486057	-77.372854	300.53	0.00	300.53
8	39.487647	-77.372897	304.27	0.00	304.27
9	39.487945	-77.372983	302.36	0.00	302.36
10	39.486786	-77.379420	296.37	0.00	296.37

Discrete Observation Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 1	1	39.479830	-77.387445	267.19	5.00
OP 2	2	39.483137	-77.365215	305.00	5.00
OP 3	3	39.483402	-77.367232	307.79	6.00
OP 4	4	39.488773	-77.367726	307.36	6.00
OP 5	5	39.480708	-77.382295	287.72	6.00

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt	Orient	"Green" Glare	"Yellow" Glare	Energy
	(°)	(°)	min	min	kWh
PV array 1	SA tracking	SA tracking	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0

Results for: PV array 1

Receptor	Green Glare (min)	Yellow Glare (min)
OP 1	0	0
OP 2	0	0
OP 3	0	0
OP 4	0	0
OP 5	0	0

Point Receptor: OP 1

0 minutes of yellow glare

0 minutes of green glare

Point Receptor: OP 2

0 minutes of yellow glare

0 minutes of green glare

Point Receptor: OP 3

0 minutes of yellow glare

0 minutes of green glare

Point Receptor: OP 4

0 minutes of yellow glare

0 minutes of green glare

Point Receptor: OP 5

0 minutes of yellow glare

0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.

Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.

The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values may differ.

Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.

Solar Glare Hazard Analysis Flight Path Report

Generated May 31, 2017, 3 p.m.

Flight path: Runway 5 - Approach from the SW

No glare found

 Print



Analysis & PV array parameters

Analysis name	Biggs Ford West
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	0.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	60.0
Rated power (kW)	15000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC

Timezone offset	-5.0
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
Correlate slope error with material	False
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	40.1
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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)	90.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	39.4798935567	-77.3801851273	307.19	10.0	317.19
2	39.4852263342	-77.3818159103	302.22	10.0	312.22
3	39.4870148761	-77.3796272278	299.23	10.0	309.23
4	39.4879753704	-77.3727178574	311.59	10.0	321.59
5	39.4876626592	-77.3725032806	312.39	10.0	322.39
6	39.4859403765	-77.3726534843	300.51	10.0	310.51
7	39.4813510023	-77.3709154129	284.43	10.0	294.43
8	39.4795291905	-77.3788547516	309.61	10.0	319.61
9	39.480059177	-77.3795413971	304.12	10.0	314.12
10	39.4799929289	-77.3798847198	305.04	10.0	315.04

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	39.4100279123	-77.3800134659	295.91	50.0	No
1/4 mi	39.4072636825	-77.3830297133	302.71	112.37	No
1/2 mi	39.4044994527	-77.3860459606	291.08	193.18	No
3/4 mi	39.401735223	-77.389062208	287.26	266.18	No
1 mi	39.3989709932	-77.3920784554	338.68	283.93	No
1 1/4 mi	39.3962067634	-77.3950947027	0.0	691.8	No
1 1/2 mi	39.3934425336	-77.3981109501	300.3	460.68	No

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
1 3/4 mi	39.3906783039	-77.4011271975	334.37	495.8	No
2 mi	39.3879140741	-77.4041434449	282.9	616.43	No

No glare found.

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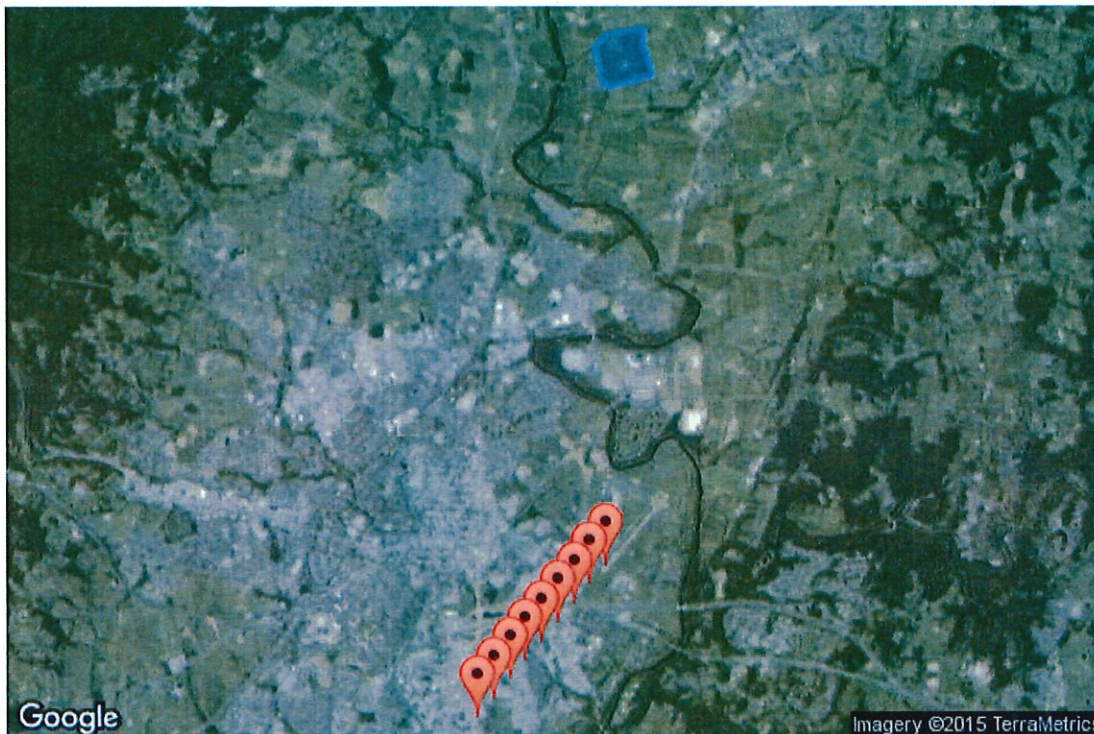
Solar Glare Hazard Analysis Flight Path Report

Generated Dec. 15, 2015, 2:46 p.m.

Flight path: Runway 5 - Approach from the SW

No glare found

 Print



Analysis & PV array parameters

Analysis name	Biggs Ford 1
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	0.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	52.0
Rated power (kW)	20000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC
Timezone offset	-5.0
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
Correlate slope error with material	False
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	40.1
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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)	90.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	39.4798935567	-77.3801851273	307.19	10.0	317.19
2	39.4852263342	-77.3818159103	302.22	10.0	312.22
3	39.4870148761	-77.3796272278	299.23	10.0	309.23
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5	39.4876626592	-77.3725032806	312.39	10.0	322.39
6	39.4859403765	-77.3726534843	300.51	10.0	310.51
7	39.4813510023	-77.3709154129	284.43	10.0	294.43
8	39.4795291905	-77.3788547516	309.61	10.0	319.61
9	39.480059177	-77.3795413971	304.12	10.0	314.12
10	39.4799929289	-77.3798847198	305.04	10.0	315.04

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	39.4102347306	-77.3797237873	297.28	50.0	No
1/4 mi	39.4074705008	-77.3827400436	301.05	115.4	No
1/2 mi	39.404706271	-77.3857562999	292.41	193.23	No
3/4 mi	39.4019420413	-77.3887725563	286.78	268.03	No
1 mi	39.3991778115	-77.3917888126	306.32	317.67	No
1 1/4 mi	39.3964135817	-77.3948050689	0.0	693.17	No
1 1/2 mi	39.393649352	-77.3978213252	253.9	508.44	No

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
1 3/4 mi	39.3908851222	-77.4008375815	355.28	476.25	No
2 mi	39.3881208924	-77.4038538378	276.77	623.94	No

No glare found.

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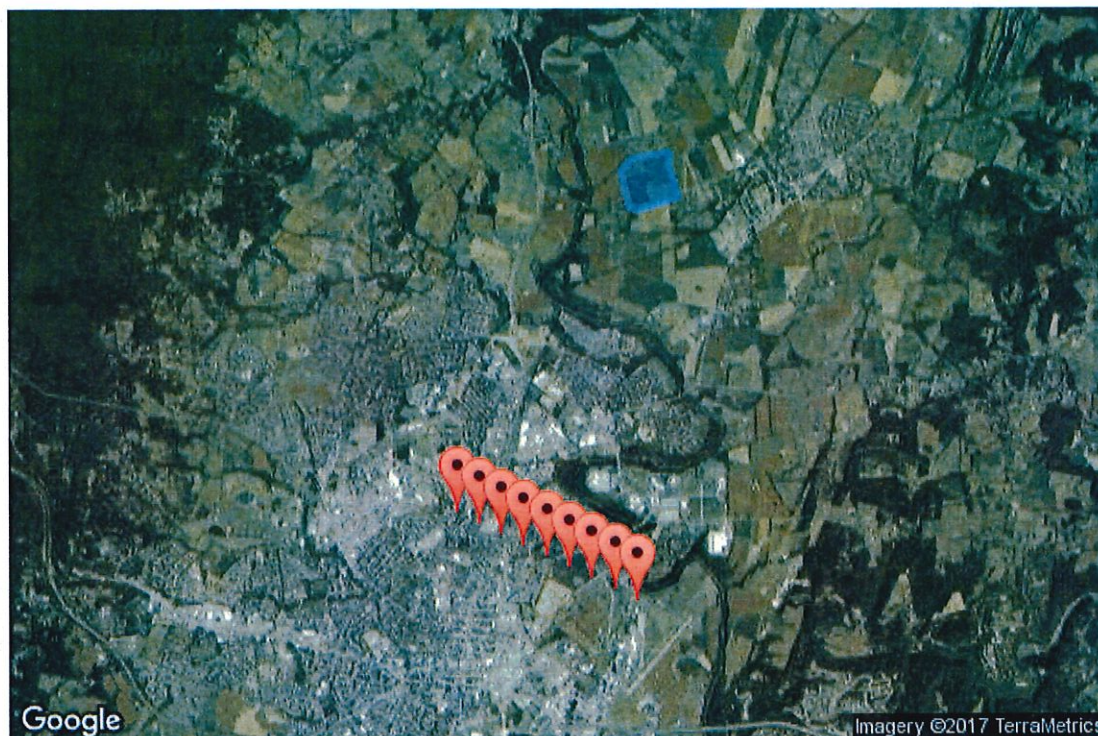
Solar Glare Hazard Analysis Flight Path Report

Generated May 31, 2017, 3:10 p.m.

Flight path: Runway 12 - Approach from W

No glare found

 Print



Analysis & PV array parameters

Analysis name	Biggs Ford West
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	0.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	60.0
Rated power (kW)	15000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC

Timezone offset	-5.0
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
Correlate slope error with material	False
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	115.78
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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)	90.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	39.4798935567	-77.3801851273	307.19	10.0	317.19
2	39.4852263342	-77.3818159103	302.22	10.0	312.22
3	39.4870148761	-77.3796272278	299.23	10.0	309.23
4	39.4879753704	-77.3727178574	311.59	10.0	321.59
5	39.4876626592	-77.3725032806	312.39	10.0	322.39
6	39.4859403765	-77.3726534843	300.51	10.0	310.51
7	39.4813510023	-77.3709154129	284.43	10.0	294.43
8	39.4795291905	-77.3788547516	309.61	10.0	319.61
9	39.480059177	-77.3795413971	304.12	10.0	314.12
10	39.4799929289	-77.3798847198	305.04	10.0	315.04

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	39.4230155452	-77.3788332939	277.3	50.0	No
1/4 mi	39.424587223	-77.3830507269	256.81	139.67	No
1/2 mi	39.4261589008	-77.3872681599	265.82	199.85	No
3/4 mi	39.4277305786	-77.391485593	282.63	252.21	No
1 mi	39.4293022564	-77.395703026	291.28	312.73	No
1 1/4 mi	39.4308739342	-77.399920459	280.47	392.73	No
1 1/2 mi	39.432445612	-77.404137892	292.94	449.43	No

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
1 3/4 mi	39.4340172897	-77.408355325	312.51	499.05	No
2 mi	39.4355889675	-77.412572758	354.41	526.32	No

No glare found.

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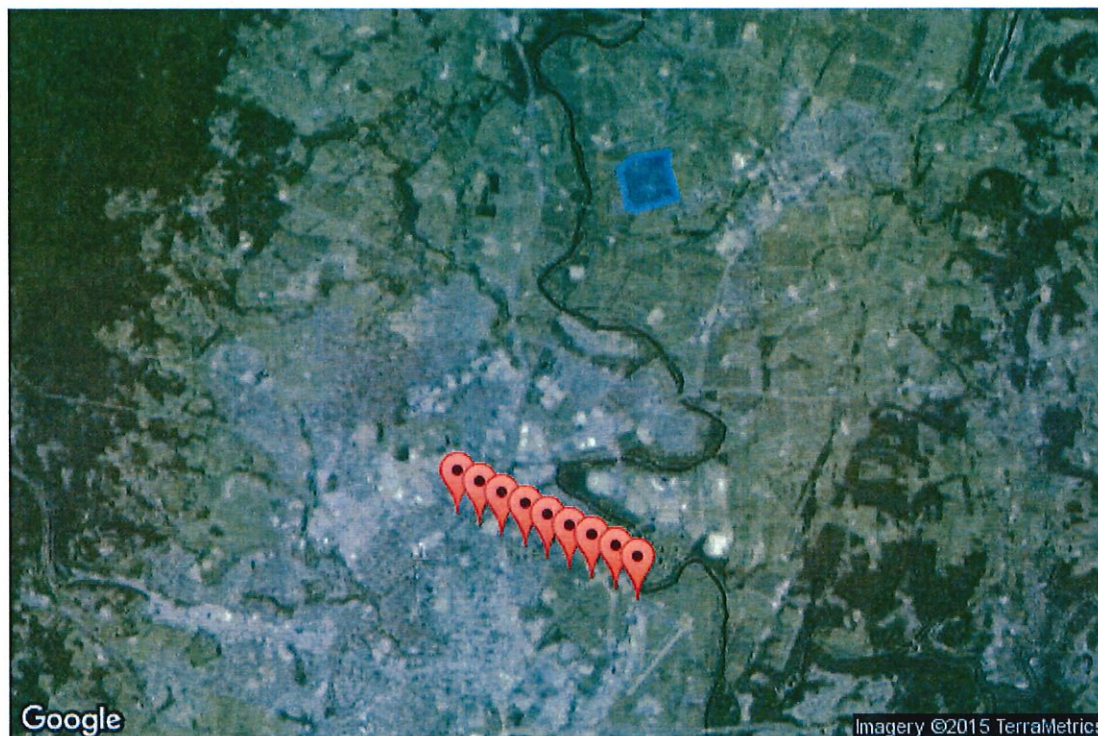
Solar Glare Hazard Analysis Flight Path Report

Generated Dec. 15, 2015, 2:59 p.m.

Flight path: Runway 12 - Approach from W

No glare found

 Print



Analysis & PV array parameters

Analysis name	Biggs Ford 1
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	0.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	52.0
Rated power (kW)	20000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC

Timezone offset	-5.0
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
Correlate slope error with material	False
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	115.78
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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)	90.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	39.4798935567	-77.3801851273	307.19	10.0	317.19
2	39.4852263342	-77.3818159103	302.22	10.0	312.22
3	39.4870148761	-77.3796272278	299.23	10.0	309.23
4	39.4879753704	-77.3727178574	311.59	10.0	321.59
5	39.4876626592	-77.3725032806	312.39	10.0	322.39
6	39.4859403765	-77.3726534843	300.51	10.0	310.51
7	39.4813510023	-77.3709154129	284.43	10.0	294.43
8	39.4795291905	-77.3788547516	309.61	10.0	319.61
9	39.480059177	-77.3795413971	304.12	10.0	314.12
10	39.4799929289	-77.3798847198	305.04	10.0	315.04

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	39.4228586984	-77.3784255981	277.56	50.0	No
1/4 mi	39.4244303762	-77.3826430217	256.4	140.33	No
1/2 mi	39.426002054	-77.3868604452	266.25	199.67	No
3/4 mi	39.4275737317	-77.3910778687	275.24	259.85	No
1 mi	39.4291454095	-77.3952952922	301.53	302.73	No
1 1/4 mi	39.4307170873	-77.3995127158	279.32	394.13	No
1 1/2 mi	39.4322887651	-77.4037301393	289.24	453.39	No

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
1 3/4 mi	39.4338604429	-77.4079475628	307.99	503.82	No
2 mi	39.4354321207	-77.4121649863	360.59	520.4	No

No glare found.

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Solar Glare Hazard Analysis Flight Path Report

Generated May 31, 2017, 3:01 p.m.

Flight path: Flight path: Runway 23 - Approach from NE

No glare found

 Print



Analysis & PV array parameters

Analysis name	Biggs Ford West
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	0.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	60.0
Rated power (kW)	15000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC
Timezone offset	-5.0
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
Correlate slope error with material	False
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	221.03
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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)	90.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	39.4798935567	-77.3801851273	307.19	10.0	317.19
2	39.4852263342	-77.3818159103	302.22	10.0	312.22
3	39.4870148761	-77.3796272278	299.23	10.0	309.23
4	39.4879753704	-77.3727178574	311.59	10.0	321.59
5	39.4876626592	-77.3725032806	312.39	10.0	322.39
6	39.4859403765	-77.3726534843	300.51	10.0	310.51
7	39.4813510023	-77.3709154129	284.43	10.0	294.43
8	39.4795291905	-77.3788547516	309.61	10.0	319.61
9	39.480059177	-77.3795413971	304.12	10.0	314.12
10	39.4799929289	-77.3798847198	305.04	10.0	315.04

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	39.4200075632	-77.3690271378	272.22	50.0	No
1/4 mi	39.4227336483	-77.3659527102	248.67	142.72	No
1/2 mi	39.4254597334	-77.3628782827	260.35	200.23	No
3/4 mi	39.4281858186	-77.3598038552	281.73	248.02	No
1 mi	39.4309119037	-77.3567294276	346.75	252.17	No
1 1/4 mi	39.4336379888	-77.3536550001	323.71	344.4	No
1 1/2 mi	39.436364074	-77.3505805726	303.77	433.52	No

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
1 3/4 mi	39.4390901591	-77.347506145	330.09	476.38	No
2 mi	39.4418162442	-77.3444317175	371.87	503.78	No

No glare found.

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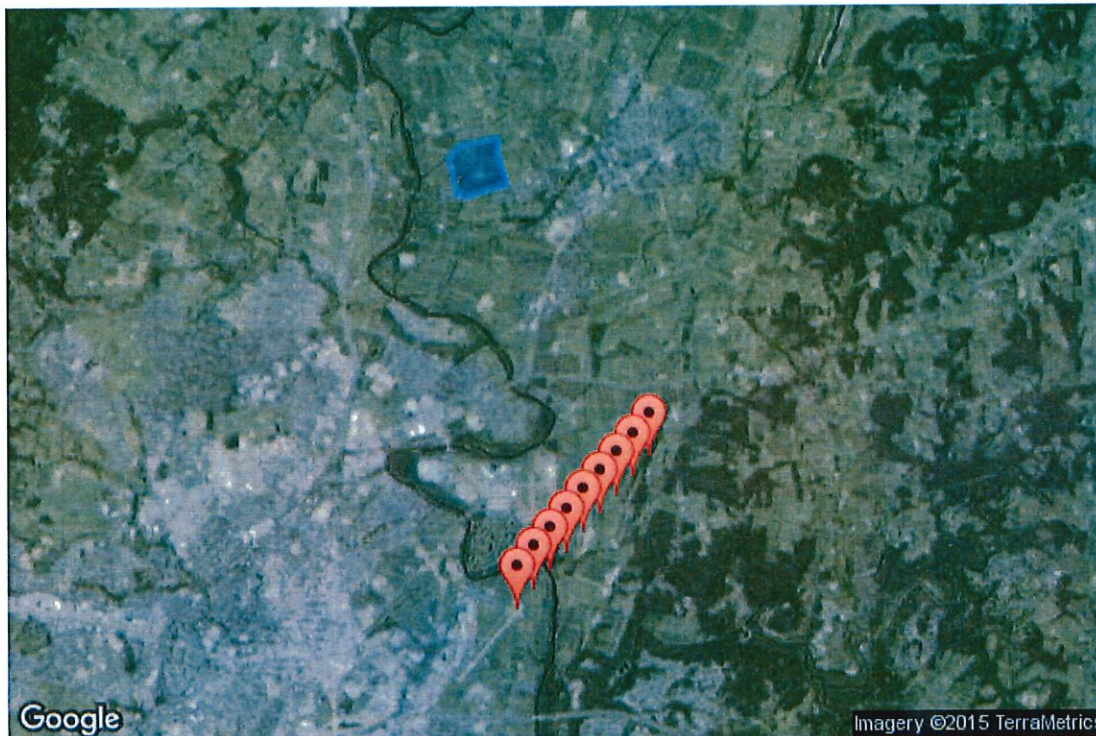
Solar Glare Hazard Analysis Flight Path Report

Generated Dec. 15, 2015, 2:45 p.m.

Flight path: Runway 23 - Approach from NE

No glare found

 Print



Analysis & PV array parameters

Analysis name	Biggs Ford 1
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	0.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	52.0
Rated power (kW)	20000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC
Timezone offset	-5.0
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
Correlate slope error with material	False
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	221.03
-----------------	--------

Glide slope (deg)	3.0
Consider pilot visibility from cockpit	True
Max downward viewing angle (deg)	30.0
Azimuthal viewing angle (deg)	90.0

PV array vertices

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9	39.480059177	-77.3795413971	304.12	10.0	314.12
10	39.4799929289	-77.3798847198	305.04	10.0	315.04

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	39.4198622441	-77.3691236973	272.15	50.0	No
1/4 mi	39.4225883293	-77.3660492762	252.17	139.16	No
1/2 mi	39.4253144144	-77.362974855	255.17	205.35	No
3/4 mi	39.4280404995	-77.3599004339	302.79	226.9	No
1 mi	39.4307665847	-77.3568260128	342.19	256.66	No
1 1/4 mi	39.4334926698	-77.3537515917	324.18	343.87	No
1 1/2 mi	39.4362187549	-77.3506771705	304.26	432.96	No

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
1 3/4 mi	39.4389448401	-77.3476027494	325.83	480.58	No
2 mi	39.4416709252	-77.3445283283	370.59	504.99	No

No glare found.

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Solar Glare Hazard Analysis Flight Path Report

Generated May 31, 2017, 3:11 p.m.

Flight path: Runway 30 - Approach from E

No glare found

 Print



Analysis & PV array parameters

Analysis name	Biggs Ford West
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	0.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	60.0
Rated power (kW)	15000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC

Timezone offset	-5.0
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
Correlate slope error with material	False
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	296.06
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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)	90.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	39.4798935567	-77.3801851273	307.19	10.0	317.19
2	39.4852263342	-77.3818159103	302.22	10.0	312.22
3	39.4870148761	-77.3796272278	299.23	10.0	309.23
4	39.4879753704	-77.3727178574	311.59	10.0	321.59
5	39.4876626592	-77.3725032806	312.39	10.0	322.39
6	39.4859403765	-77.3726534843	300.51	10.0	310.51
7	39.4813510023	-77.3709154129	284.43	10.0	294.43
8	39.4795291905	-77.3788547516	309.61	10.0	319.61
9	39.480059177	-77.3795413971	304.12	10.0	314.12
10	39.4799929289	-77.3798847198	305.04	10.0	315.04

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	39.4193387059	-77.3690915108	276.75	50.0	No
1/4 mi	39.4177511445	-77.3648843045	240.49	155.43	No
1/2 mi	39.4161635832	-77.3606770983	281.38	183.73	No
3/4 mi	39.4145760218	-77.3564698921	299.03	235.25	No
1 mi	39.4129884605	-77.3522626859	412.62	190.84	No
1 1/4 mi	39.4114008992	-77.3480554796	290.72	381.92	No
1 1/2 mi	39.4098133378	-77.3438482734	352.5	389.32	No

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
1 3/4 mi	39.4082257765	-77.3396410672	379.77	431.24	No
2 mi	39.4066382151	-77.3354338609	408.86	471.32	No

No glare found.

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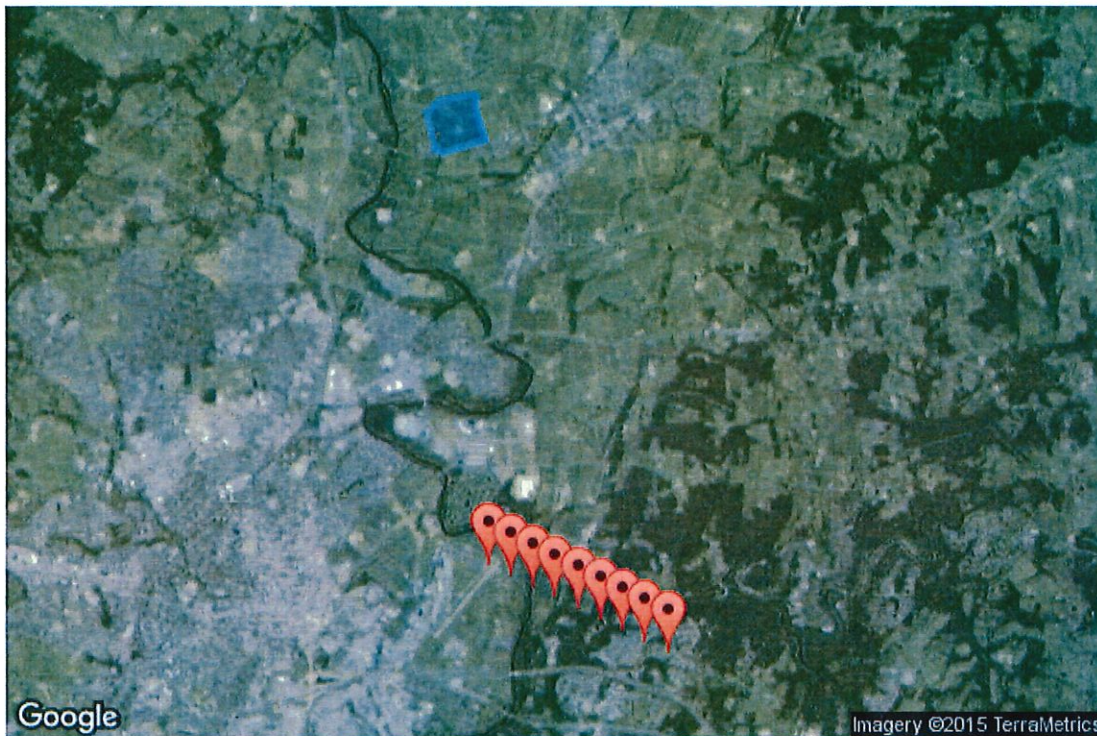
Solar Glare Hazard Analysis Flight Path Report

Generated Dec. 15, 2015, 2:58 p.m.

Flight path: Runway 30 - Approach from E

No glare found

 Print



Analysis & PV array parameters

Analysis name	Biggs Ford 1
PV array axis tracking	single
Tilt of tracking axis (deg)	0.0
Orientation of tracking axis (deg)	0.0
Offset angle of module (deg)	0.0
Limit rotation angle?	True
Maximum tracking angle (deg)	52.0
Rated power (kW)	20000.0
Vary reflectivity	True
PV surface material	Smooth glass without ARC
Timezone offset	-5.0
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
Correlate slope error with material	False
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	296.06
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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)	90.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height of panels above ground (ft)	Total elevation (ft)
1	39.4798935567	-77.3801851273	307.19	10.0	317.19
2	39.4852263342	-77.3818159103	302.22	10.0	312.22
3	39.4870148761	-77.3796272278	299.23	10.0	309.23
4	39.4879753704	-77.3727178574	311.59	10.0	321.59
5	39.4876626592	-77.3725032806	312.39	10.0	322.39
6	39.4859403765	-77.3726534843	300.51	10.0	310.51
7	39.4813510023	-77.3709154129	284.43	10.0	294.43
8	39.4795291905	-77.3788547516	309.61	10.0	319.61
9	39.480059177	-77.3795413971	304.12	10.0	314.12
10	39.4799929289	-77.3798847198	305.04	10.0	315.04

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
Threshold	39.4198082324	-77.3703575134	276.6	50.0	No
1/4 mi	39.418220671	-77.3661502789	248.21	147.57	No
1/2 mi	39.4166331097	-77.3619430443	271.57	193.4	No
3/4 mi	39.4150455484	-77.3577358097	292.03	242.11	No
1 mi	39.413457987	-77.3535285752	423.96	179.35	No
1 1/4 mi	39.4118704257	-77.3493213406	265.16	407.34	No
1 1/2 mi	39.4102828643	-77.345114106	361.17	380.51	No

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Eye-level height above ground (ft)	Glare?
1 3/4 mi	39.408695303	-77.3409068714	347.15	463.71	No
2 mi	39.4071077416	-77.3366996369	400.48	479.56	No

No glare found.

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