ForgeSolar

SV CSG Mankato North 1

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Created Sep 27, 2023
Updated Sep 27, 2023
Time-step 1 minute
Timezone offset UTC-6
Minimum sun altitude 0.0 deg
Site ID 101680.17716

Project type Basic
Project status: active
Category 500 kW to 1 MW
(1,000 kW / 8 acre limit)

Misc. Analysis Settings

DNI: **varies (1,000.0 W/m^2 peak)**
Ocular transmission coefficient: **0.5**
Pupil diameter: **0.002 m**
Eye focal length: **0.017 m**
Sun subtended angle: **9.3 mrad**

PV Analysis Methodology: **Version 2**
Enhanced subtended angle calculation: **On**

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
SV CSG Mankato North 1	SA tracking	SA tracking	0	0	-

Component Data

PV Array(s)

Total PV footprint area: 6.3 acres

Name: SV CSG Mankato North 1
Footprint area: 6.3 acres
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 180.0 deg
Maximum tracking angle: 60.0 deg
Resting angle: 0.0 deg
Ground Coverage Ratio: 0.33

Rated power: -
Panel material: Smooth glass without AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 6.55 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	44.224460	-93.980558	816.03	0.00	816.03
2	44.224475	-93.979239	818.70	0.00	818.70
3	44.224095	-93.979105	819.13	0.00	819.13
4	44.224103	-93.978638	820.38	0.00	820.38
5	44.222484	-93.978568	821.69	0.00	821.69
6	44.222523	-93.979244	819.59	0.00	819.59
7	44.222965	-93.979330	819.95	0.00	819.95
8	44.223195	-93.980344	817.75	0.00	817.75
9	44.223207	-93.980580	816.38	0.00	816.38

Route Receptor(s)

Name: Route 1
Route type Two-way
View angle: 50.0 deg

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	44.221664	-93.989250	825.36	0.00	825.36
2	44.225178	-93.987222	812.40	0.00	812.40

Discrete Observation Receptors

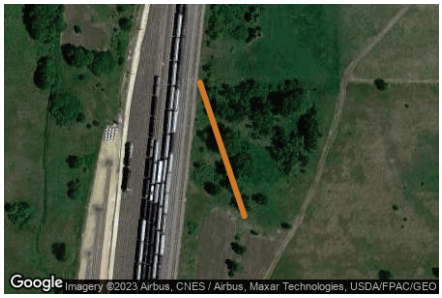
Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 1	44.223834	-93.971805	865.88	0.00	865.88
OP 2	44.229600	-93.980882	827.70	0.00	827.70
OP 3	44.227540	-93.983671	811.25	0.00	811.25
OP 4	44.225543	-93.971942	868.49	0.00	868.49
OP 5	44.221219	-93.988037	829.32	0.00	829.32
OP 6	44.224604	-93.983331	815.25	0.00	815.25

Obstruction Components

Name: Obstruction 1
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.225248	-93.980786	815.54
2	44.225010	-93.980711	817.16
3	44.225064	-93.976967	825.13
4	44.225279	-93.977192	824.92
5	44.225248	-93.980786	815.54

Name: Obstruction 10
Upper edge height: 32.8 ft



Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.221532	-93.983593	820.32
2	44.220471	-93.983099	819.34

Name: Obstruction 2
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.223947	-93.975108	825.85
2	44.222932	-93.974958	825.75
3	44.223116	-93.975344	826.06
4	44.223947	-93.975108	825.85

Name: Obstruction 3
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.222439	-93.975053	826.14
2	44.222624	-93.975847	826.38
3	44.222501	-93.976662	823.14
4	44.222331	-93.978035	822.37
5	44.222008	-93.977842	823.82
6	44.221686	-93.976963	828.22
7	44.221593	-93.974860	827.84
8	44.222439	-93.975053	826.14

Name: Obstruction 4
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.229538	-93.980958	823.45
2	44.229377	-93.981430	815.16
3	44.228992	-93.982374	813.00
4	44.228731	-93.982546	812.83
5	44.228900	-93.981323	813.55
6	44.229338	-93.980497	823.24
7	44.229538	-93.980958	823.45

Name: Obstruction 5
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.222349	-93.979325	820.00
2	44.222902	-93.980055	819.22
3	44.222979	-93.980699	817.54

Name: Obstruction 6
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.225163	-93.985291	807.74
2	44.221242	-93.985183	811.78

Name: Obstruction 7
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.222410	-93.982995	815.08
2	44.221841	-93.983037	817.89

Name: Obstruction 8
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.225186	-93.976375	825.27
2	44.223879	-93.974090	828.47

Name: Obstruction 9
Upper edge height: 32.8 ft

Vertex	Latitude	Longitude	Ground elevation
	deg	deg	ft
1	44.225068	-93.982971	811.62
2	44.224207	-93.983057	811.45

Summary of PV Glare Analysis

PV configuration and total predicted glare

PV Name	Tilt deg	Orientation deg	"Green" Glare min	"Yellow" Glare min	Energy Produced kWh	Data File
SV CSG Mankato North 1	SA tracking	SA tracking	0	0	-	-

PV & Receptor Analysis Results

Results for each PV array and receptor

SV CSG Mankato North 1 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	0
OP: OP 5	0	0
OP: OP 6	0	0
Route: Route 1	0	0

No glare found

Assumptions

- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not automatically account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographi obstructions.
- Detailed system geometry is not rigorously simulated.
- The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values and results may vary.
- The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
- Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for larg PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, nc discrete, spectrum.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Refer to the **Help page** for detailed assumptions and limitations not listed here.