

# Appendix 7E: Road Receptor Glare Results (40 Deg)





# ForgeSolar

# Site Configuration: Derrill Water Solar Farm Road 40 Deg

Project site configuration details and results.



Created Jan. 28, 2021 1:35 p.m.
Updated Jan. 29, 2021 3:58 a.m.
DNI varies and peaks at 1,000.0 W/m^2
Analyze every 1 minute(s)
0.5 ocular transmission coefficient
0.002 m pupil diameter
0.017 m eye focal length
9.3 mrad sun subtended angle
Timezone UTC0
Site Configuration ID: 48804.8678

## Summary of Results Glare with potential for temporary after-image predicted

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
PV array 1	40.0	180.0	13,576	53,616	-
PV array 2	40.0	180.0	4,342	20,136	-
PV array 3	40.0	180.0	22,501	41,053	-
PV array 4	40.0	180.0	2,390	53,186	-

# **Component Data**

PV Array(s)

Name: PV array 1 Axis tracking: Fixed (no rotation) Tilt: 40.0 deg

Orientation: 180.0 deg Rated power: -

Panel material: Light textured glass with AR

coating

Vary reflectivity with sun position? Yes Correlate slope error with surface type? Yes

Slope error: 9.16 mrad Approx. area: 104,635 sq-m



Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	50.797429	-4.419972	109.23	2.80	112.03
2	50.797076	-4.421195	110.38	2.80	113.18
3	50.796263	-4.423405	113.22	2.80	116.02
4	50.795978	-4.423383	111.97	2.80	114.77
5	50.795625	-4.424564	114.77	2.80	117.57
6	50.794866	-4.424006	114.96	2.80	117.76
7	50.794160	-4.425143	117.83	2.80	120.63
8	50.793146	-4.424408	120.28	2.80	123.08
9	50.792180	-4.420680	118.45	2.80	121.25
10	50.792343	-4.419972	119.63	2.80	122.43
11	50.792085	-4.419628	119.51	2.80	122.31
12	50.791814	-4.418770	120.50	2.80	123.30
13	50.792004	-4.417504	122.88	2.80	125.68
14	50.793075	-4.418770	119.76	2.80	122.56
15	50.792492	-4.420186	119.57	2.80	122.37
16	50.793794	-4.421881	118.48	2.80	121.28
17	50.794906	-4.422718	116.38	2.80	119.18
18	50.795476	-4.421517	115.69	2.80	118.49
19	50.795788	-4.422353	112.48	2.80	115.28
20	50.796819	-4.419628	109.12	2.80	111.92

Name: PV array 2 Axis tracking: Fixed (no rotation) Tilt: 40.0 deg Orientation: 180.0 deg Rated power: -

Panel material: Light textured glass with AR

coating

Vary reflectivity with sun position? Yes Correlate slope error with surface type? Yes

Slope error: 9.16 mrad Approx. area: 123,918 sq-m



Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	50.793017	-4.424714	121.10	2.80	123.90
2	50.792088	-4.424113	118.62	2.80	121.42
3	50.790392	-4.422944	115.31	2.80	118.11
4	50.789938	-4.424167	114.47	2.80	117.27
5	50.789314	-4.425604	114.51	2.80	117.31
6	50.788479	-4.424853	109.52	2.80	112.32
7	50.787530	-4.424810	113.00	2.80	115.80
8	50.786248	-4.424177	123.13	2.80	125.93
9	50.785855	-4.423362	123.52	2.80	126.32
10	50.785536	-4.422139	122.27	2.80	125.07
11	50.786953	-4.421291	114.55	2.80	117.35
12	50.787082	-4.421903	114.94	2.80	117.74
13	50.787367	-4.422407	114.49	2.80	117.29
14	50.788032	-4.422729	110.30	2.80	113.10
15	50.788771	-4.422418	107.16	2.80	109.96
16	50.790087	-4.423705	112.58	2.80	115.38
17	50.790229	-4.423115	113.53	2.80	116.33
18	50.788954	-4.422257	106.46	2.80	109.26
19	50.788839	-4.421012	104.92	2.80	107.72
20	50.789212	-4.420455	106.94	2.80	109.74
21	50.790148	-4.421109	111.73	2.80	114.53
22	50.790243	-4.421710	112.87	2.80	115.67
23	50.790840	-4.422182	117.46	2.80	120.26
24	50.791206	-4.421967	117.58	2.80	120.38
25	50.791776	-4.422613	117.19	2.80	119.99
26	50.792284	-4.421905	118.75	2.80	121.55

Name: PV array 3

Axis tracking: Fixed (no rotation)

Tilt: 40.0 deg

Orientation: 180.0 deg

Rated power: -

Panel material: Light textured glass with AR

coating

Vary reflectivity with sun position? Yes Correlate slope error with surface type? Yes

Slope error: 9.16 mrad Approx. area: 55,593 sq-m



Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	50.795143	-4.415966	111.26	2.80	114.06
2	50.794139	-4.415215	114.25	2.80	117.05
3	50.794166	-4.414808	112.87	2.80	115.67
4	50.792877	-4.413542	118.54	2.80	121.34
5	50.793366	-4.411214	105.72	2.80	108.52
6	50.793434	-4.410935	103.79	2.80	106.59
7	50.794105	-4.410677	100.41	2.80	103.21
8	50.794641	-4.411374	101.20	2.80	104.00
9	50.794824	-4.411385	101.61	2.80	104.41
10	50.795122	-4.411825	102.45	2.80	105.25
11	50.795109	-4.412179	104.62	2.80	107.42
12	50.794620	-4.413220	106.82	2.80	109.62
13	50.794973	-4.413949	109.04	2.80	111.84
14	50.795163	-4.415054	109.12	2.80	111.92

Name: PV array 4

Axis tracking: Fixed (no rotation)

Tilt: 40.0 deg

Orientation: 180.0 deg Rated power: -

Panel material: Light textured glass with AR

coating

Vary reflectivity with sun position? Yes Correlate slope error with surface type? Yes

Slope error: 9.16 mrad Approx. area: 228,907 sq-m



Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	m	m	m
1	50.793275	-4.410921	104.89	2.80	107.69
2	50.792597	-4.414462	121.95	2.80	124.75
3	50.791708	-4.413743	115.50	2.80	118.30
4	50.791152	-4.415556	117.59	2.80	120.39
5	50.790135	-4.417681	114.28	2.80	117.08
6	50.789339	-4.416457	110.99	2.80	113.79
7	50.787651	-4.415782	110.89	2.80	113.69
8	50.787311	-4.416683	109.86	2.80	112.66
9	50.786911	-4.417101	104.28	2.80	107.08
10	50.786592	-4.416597	101.77	2.80	104.57
11	50.786185	-4.416425	101.10	2.80	103.90
12	50.784273	-4.419344	115.39	2.80	118.19
13	50.783689	-4.418839	119.07	2.80	121.87
14	50.784605	-4.416329	111.10	2.80	113.90
15	50.784971	-4.413958	103.21	2.80	106.01
16	50.785358	-4.413089	97.54	2.80	100.34
17	50.786660	-4.414333	97.45	2.80	100.25
18	50.786796	-4.413925	97.08	2.80	99.88
19	50.787773	-4.413389	97.50	2.80	100.30
20	50.788580	-4.413507	99.59	2.80	102.39
21	50.790804	-4.411764	104.92	2.80	107.72
22	50.791759	-4.411405	104.86	2.80	107.66
23	50.791979	-4.411502	105.72	2.80	108.52
24	50.792118	-4.411298	105.52	2.80	108.32

### **Discrete Observation Receptors**

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	m	m	m
OP 1	50.799080	-4.437101	136.13	1.50	137.63
OP 2	50.798999	-4.434772	139.29	1.50	140.79
OP 3	50.799277	-4.431854	137.54	1.50	139.04
OP 4	50.801174	-4.408308	124.45	1.50	125.95
OP 5	50.801216	-4.405429	126.83	1.50	128.33
OP 6	50.801504	-4.402361	130.54	1.50	132.04
OP 7	50.793885	-4.398547	132.05	1.50	133.55
OP 8	50.793535	-4.400988	127.82	1.50	129.32
OP 9	50.793220	-4.404099	117.95	1.50	119.45
OP 10	50.793291	-4.406948	124.28	1.50	125.78
OP 11	50.793315	-4.409807	100.99	1.50	102.49
OP 12	50.793020	-4.412350	112.16	1.50	113.66
OP 13	50.792522	-4.415048	123.23	1.50	124.73
OP 14	50.791823	-4.417768	122.17	1.50	123.67
OP 15	50.792077	-4.420713	118.52	1.50	120.02
OP 16	50.792684	-4.423148	119.31	1.50	120.81
OP 17	50.793285	-4.425648	121.13	1.50	122.63
OP 18	50.792634	-4.428079	122.02	1.50	123.52
OP 19	50.791648	-4.430943	122.58	1.50	124.08
OP 20	50.796528	-4.436780	127.80	1.50	129.30
OP 21	50.794696	-4.435314	121.78	1.50	123.28
OP 22	50.793092	-4.434535	118.22	1.50	119.72
OP 23	50.791691	-4.432911	119.98	1.50	121.48
OP 24	50.790178	-4.432064	118.23	1.50	119.73
OP 25	50.788622	-4.431779	119.41	1.50	120.91
OP 26	50.786800	-4.430407	119.97	1.50	121.47
OP 27	50.785067	-4.428895	121.10	1.50	122.60
OP 28	50.783871	-4.427490	129.84	1.50	131.34
OP 29	50.782168	-4.426132	132.76	1.50	134.26
OP 30	50.782284	-4.423799	126.48	1.50	127.98
OP 31	50.782121	-4.421149	117.95	1.50	119.45
OP 32	50.781341	-4.407889	113.23	1.50	114.73
OP 33	50.781914	-4.405062	126.74	1.50	128.24
OP 34	50.782840	-4.403168	126.79	1.50	128.29
OP 35	50.784120	-4.401396	126.11	1.50	127.61

# **PV Array Results**

# Summary of PV Glare Analysis PV configuration and predicted glare

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced	Data File 😯
	deg	deg	min	min	kWh	
PV array 1	40.0	180.0	13,576	53,616	-	-
PV array 2	40.0	180.0	4,342	20,136	-	-
PV array 3	40.0	180.0	22,501	41,053	-	-
PV array 4	40.0	180.0	2,390	53,186	-	-

Click the name of the PV array to scroll to its results

# PV & Receptor Analysis Results detailed results for each PV array and receptor

#### PV array 1 potential temporary after-image



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
OP: OP 7	375	116
OP: OP 8	246	448
OP: OP 9	62	273
OP: OP 10	212	1103
OP: OP 11	43	2065
OP: OP 12	8	1156
OP: OP 13	240	3581
OP: OP 14	7038	9427
OP: OP 15	0	6826
OP: OP 16	4422	10298
OP: OP 17	527	7238
OP: OP 18	0	4374
OP: OP 19	72	2671
OP: OP 20	21	325
OP: OP 21	8	987
OP: OP 22	117	1137
OP: OP 23	185	1435
OP: OP 24	0	75
OP: OP 25	0	81
OP: OP 26	0	0
OP: OP 27	0	0

OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 30	0	0
OP: OP 31	0	0
OP: OP 32	0	0
OP: OP 33	0	0
OP: OP 34	0	0
OP: OP 35	0	0

PV array 1 - OP Receptor (OP 1)

No glare found

PV array 1 - OP Receptor (OP 2)

No glare found

PV array 1 - OP Receptor (OP 3)

No glare found

PV array 1 - OP Receptor (OP 4)

No glare found

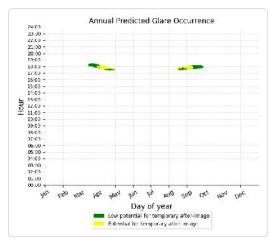
PV array 1 - OP Receptor (OP 5)

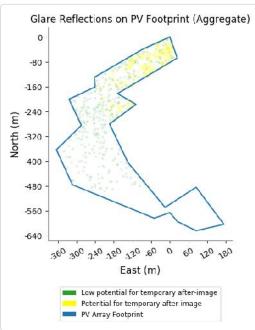
No glare found

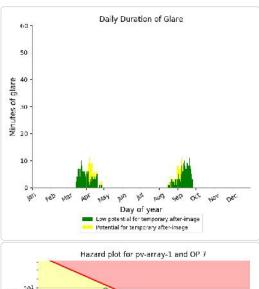
PV array 1 - OP Receptor (OP 6)

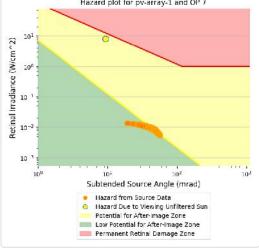
#### PV array 1 - OP Receptor (OP 7)

- 375 minutes of "green" glare with low potential to cause temporary after-image.
- 116 minutes of "yellow" glare with potential to cause temporary after-image.



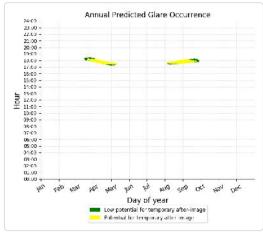


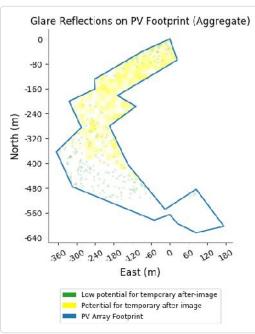


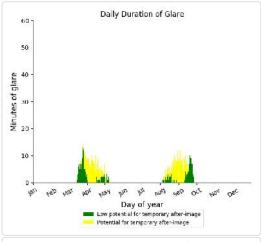


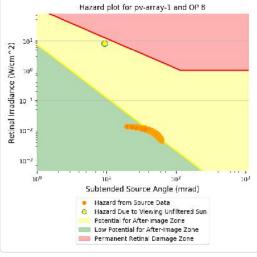
#### PV array 1 - OP Receptor (OP 8)

- 246 minutes of "green" glare with low potential to cause temporary after-image.
- 448 minutes of "yellow" glare with potential to cause temporary after-image.



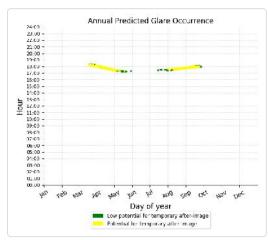


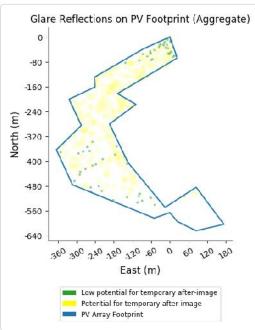


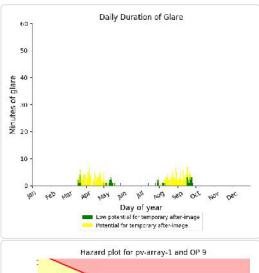


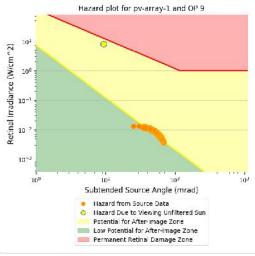
#### PV array 1 - OP Receptor (OP 9)

- 62 minutes of "green" glare with low potential to cause temporary after-image.
- 273 minutes of "yellow" glare with potential to cause temporary after-image.



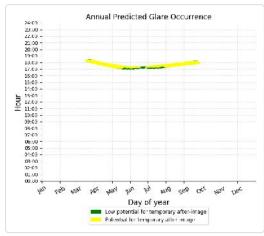


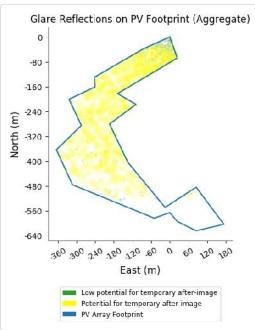


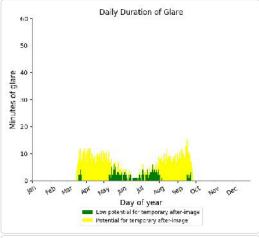


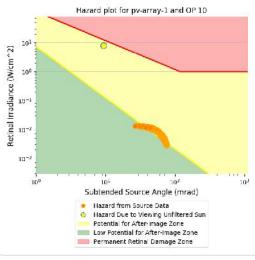
#### PV array 1 - OP Receptor (OP 10)

- 212 minutes of "green" glare with low potential to cause temporary after-image.
- 1,103 minutes of "yellow" glare with potential to cause temporary after-image.



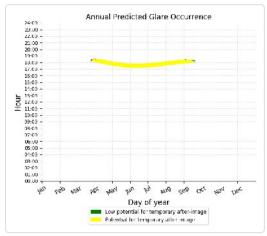


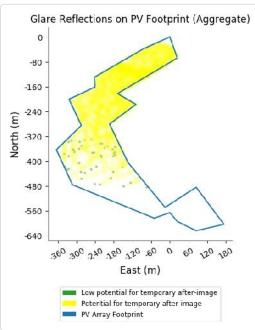


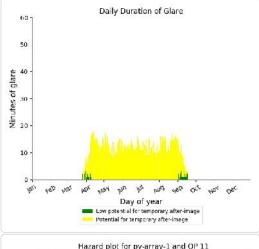


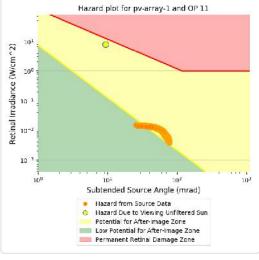
#### PV array 1 - OP Receptor (OP 11)

- 43 minutes of "green" glare with low potential to cause temporary after-image.
- 2,065 minutes of "yellow" glare with potential to cause temporary after-image.





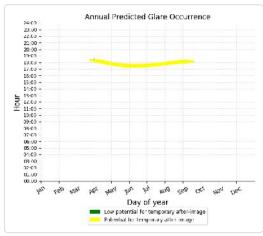


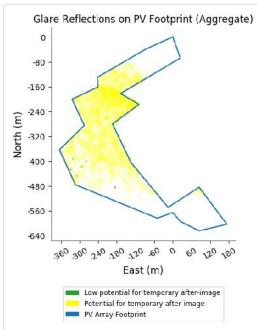


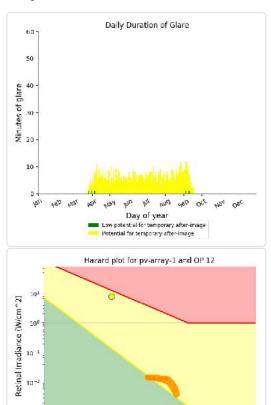
#### PV array 1 - OP Receptor (OP 12)

PV array is expected to produce the following glare for receptors at this location:

- 8 minutes of "green" glare with low potential to cause temporary after-image.
- 1,156 minutes of "yellow" glare with potential to cause temporary after-image.







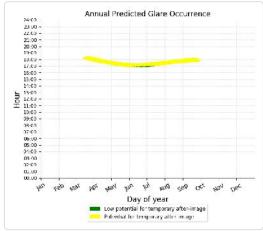
101

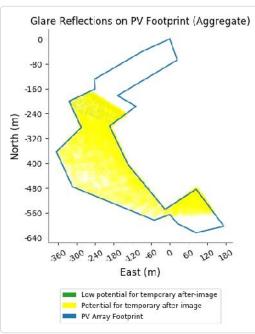
Subtended Source Angle (mrad)

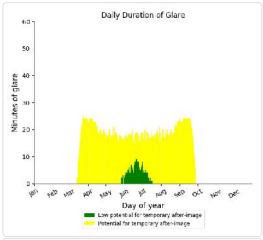
Hazard from Source Data
Hazard Due to Viewing Unfiltered Sun
Potential for After-Image Zone
Low Potential for After-Image Zone
Permanent Retinal Damage Zone

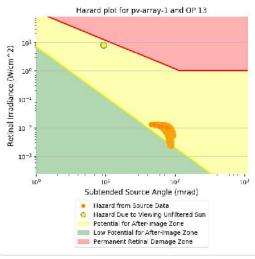
#### PV array 1 - OP Receptor (OP 13)

- 240 minutes of "green" glare with low potential to cause temporary after-image.
- 3,581 minutes of "yellow" glare with potential to cause temporary after-image.



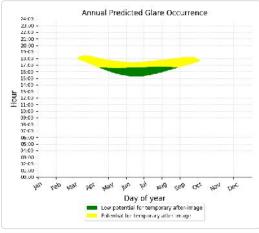


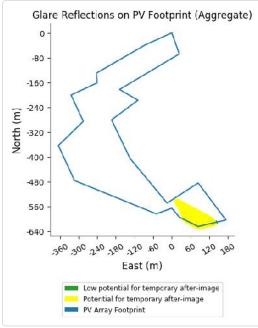


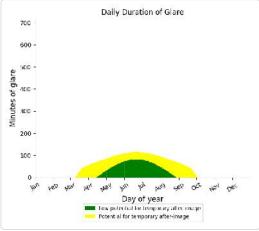


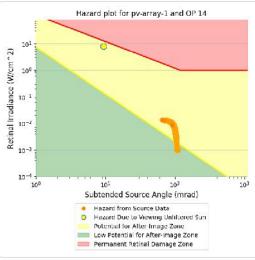
#### PV array 1 - OP Receptor (OP 14)

- 7,038 minutes of "green" glare with low potential to cause temporary after-image.
- 9,427 minutes of "yellow" glare with potential to cause temporary after-image.



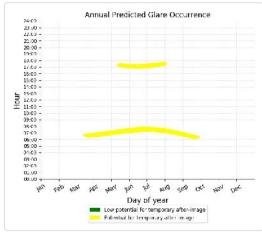


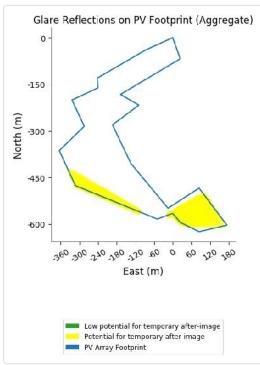


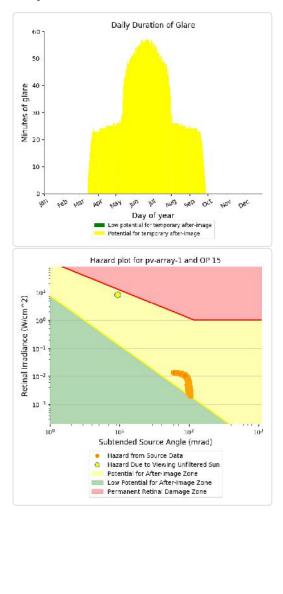


#### PV array 1 - OP Receptor (OP 15)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 6,826 minutes of "yellow" glare with potential to cause temporary after-image.

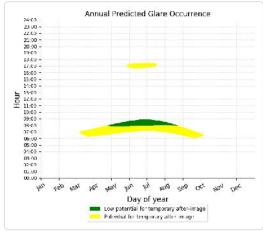


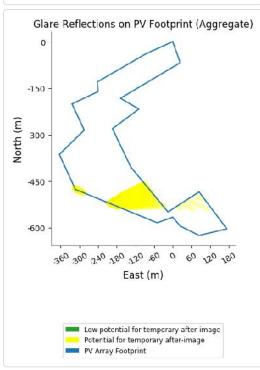


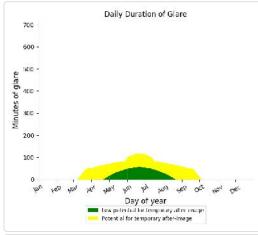


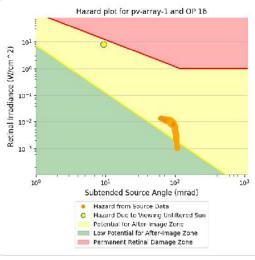
#### PV array 1 - OP Receptor (OP 16)

- 4,422 minutes of "green" glare with low potential to cause temporary after-image.
- 10,298 minutes of "yellow" glare with potential to cause temporary after-image.



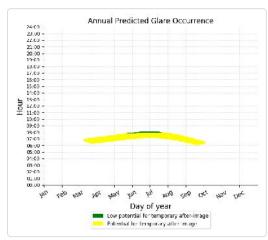


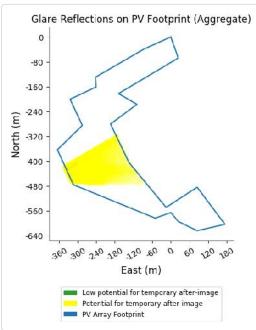


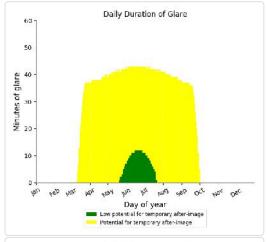


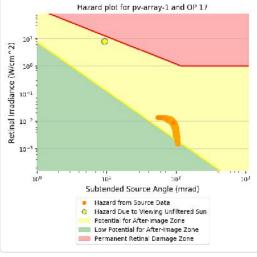
#### PV array 1 - OP Receptor (OP 17)

- 527 minutes of "green" glare with low potential to cause temporary after-image.
- 7,238 minutes of "yellow" glare with potential to cause temporary after-image.



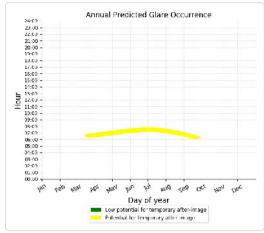


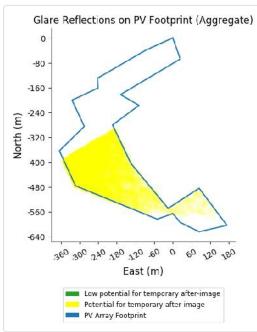


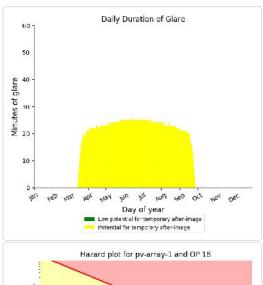


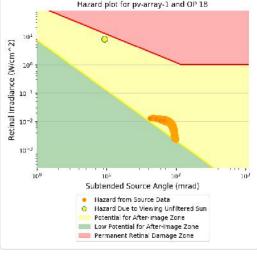
#### PV array 1 - OP Receptor (OP 18)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 4,374 minutes of "yellow" glare with potential to cause temporary after-image.



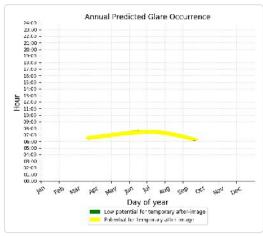


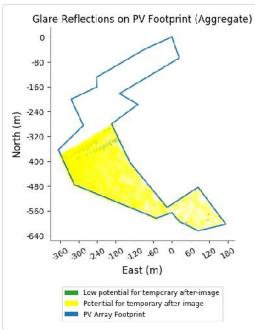


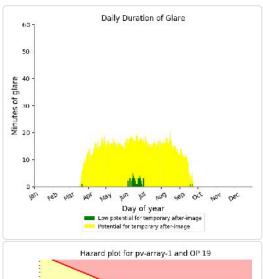


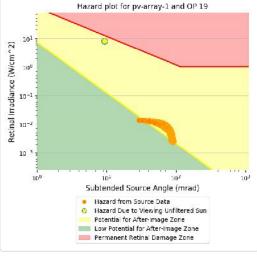
#### PV array 1 - OP Receptor (OP 19)

- 72 minutes of "green" glare with low potential to cause temporary after-image.
- 2,671 minutes of "yellow" glare with potential to cause temporary after-image.



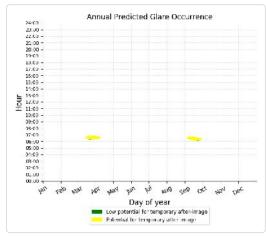


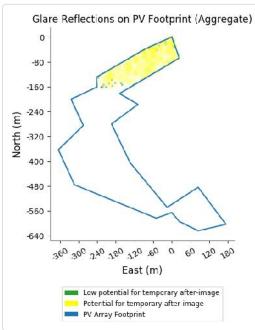


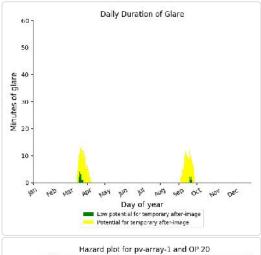


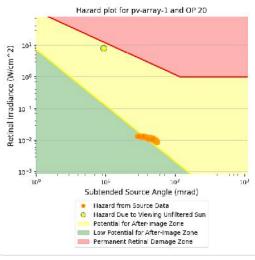
#### PV array 1 - OP Receptor (OP 20)

- 21 minutes of "green" glare with low potential to cause temporary after-image.
- 325 minutes of "yellow" glare with potential to cause temporary after-image.



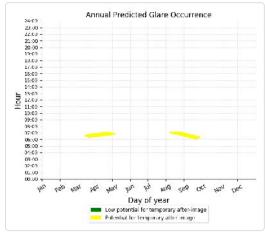


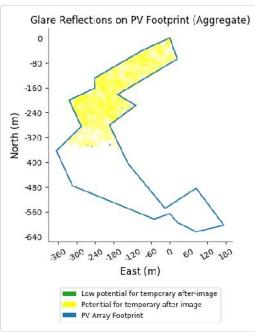


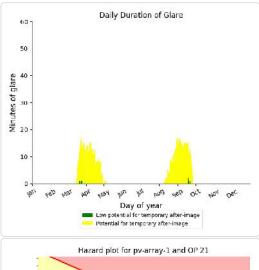


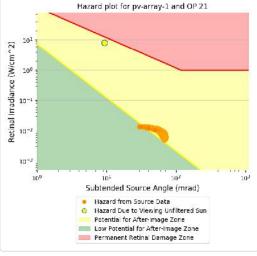
#### PV array 1 - OP Receptor (OP 21)

- 8 minutes of "green" glare with low potential to cause temporary after-image.
- 987 minutes of "yellow" glare with potential to cause temporary after-image.



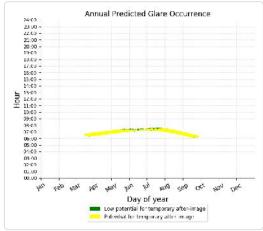


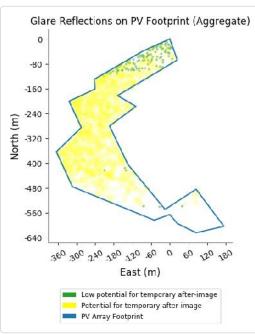


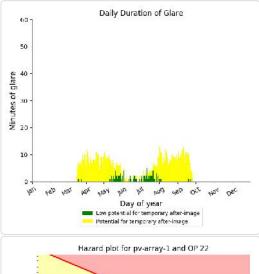


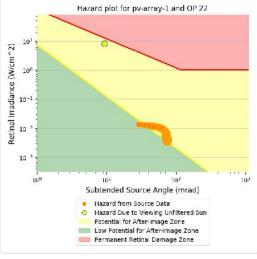
#### PV array 1 - OP Receptor (OP 22)

- 117 minutes of "green" glare with low potential to cause temporary after-image.
- 1,137 minutes of "yellow" glare with potential to cause temporary after-image.



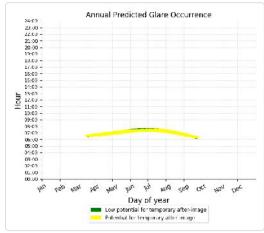


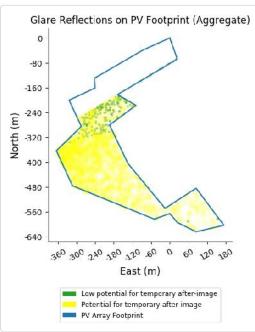


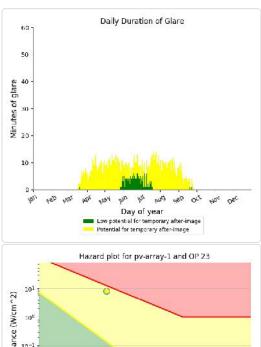


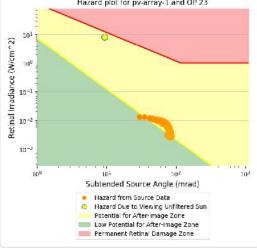
#### PV array 1 - OP Receptor (OP 23)

- 185 minutes of "green" glare with low potential to cause temporary after-image.
- 1,435 minutes of "yellow" glare with potential to cause temporary after-image.



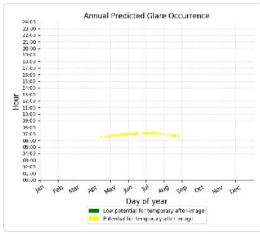


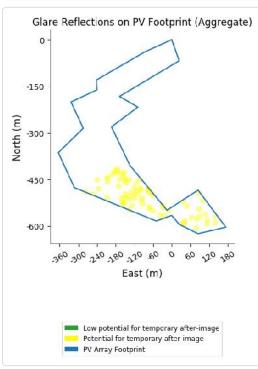


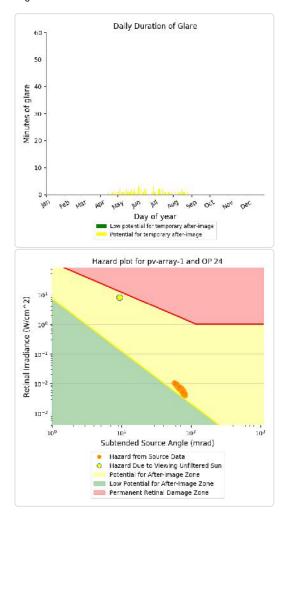


#### PV array 1 - OP Receptor (OP 24)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 75 minutes of "yellow" glare with potential to cause temporary after-image.



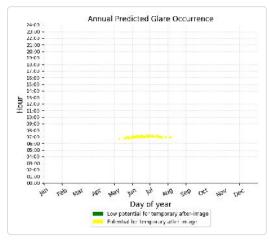


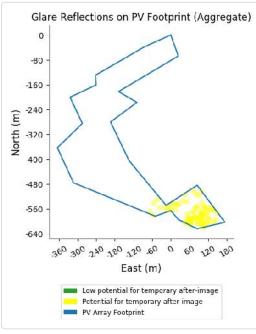


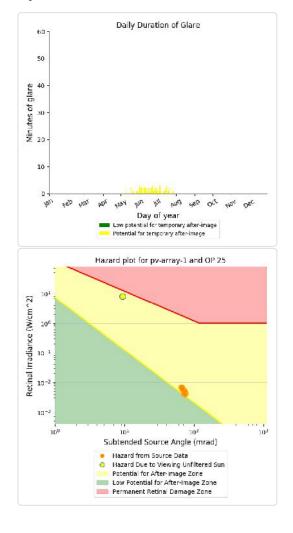
#### PV array 1 - OP Receptor (OP 25)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 81 minutes of "yellow" glare with potential to cause temporary after-image.







#### PV array 1 - OP Receptor (OP 26)

No glare found

PV array 1 - OP Receptor (OP 27)

No glare found

PV array 1 - OP Receptor (OP 28)

No glare found

PV array 1 - OP Receptor (OP 29)

PV array 1 - OP Receptor (OP 30)

No glare found

PV array 1 - OP Receptor (OP 31)

No glare found

PV array 1 - OP Receptor (OP 32)

No glare found

PV array 1 - OP Receptor (OP 33)

No glare found

PV array 1 - OP Receptor (OP 34)

No glare found

PV array 1 - OP Receptor (OP 35)

#### PV array 2 potential temporary after-image



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
OP: OP 7	2	0
OP: OP 8	4	0
OP: OP 9	14	0
OP: OP 10	4	4
OP: OP 11	0	0
OP: OP 12	0	0
OP: OP 13	0	276
OP: OP 14	0	1269
OP: OP 15	0	1733
OP: OP 16	0	2159
OP: OP 17	0	0
OP: OP 18	0	327
OP: OP 19	0	820
OP: OP 20	0	0
OP: OP 21	0	0
OP: OP 22	1	9
OP: OP 23	0	651
OP: OP 24	1	2549
OP: OP 25	0	2441
OP: OP 26	0	2896
OP: OP 27	0	2458
OP: OP 28	0	575
OP: OP 29	0	0
OP: OP 30	0	0
OP: OP 31	0	0
OP: OP 32	266	100
OP: OP 33	1234	441
OP: OP 34	1487	665
OP: OP 35	1329	763

PV array 2 - OP Receptor (OP 1)

No glare found

PV array 2 - OP Receptor (OP 2)

No glare found

PV array 2 - OP Receptor (OP 3)

#### PV array 2 - OP Receptor (OP 4)

No glare found

#### PV array 2 - OP Receptor (OP 5)

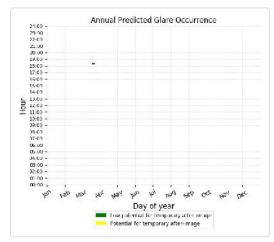
No glare found

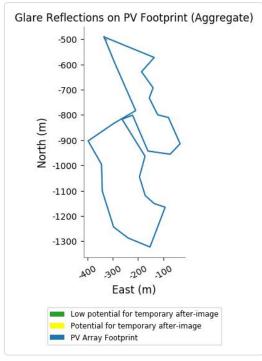
#### PV array 2 - OP Receptor (OP 6)

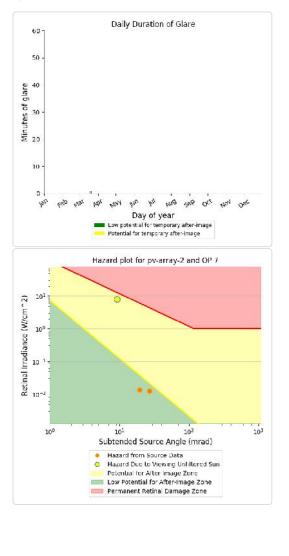
No glare found

#### PV array 2 - OP Receptor (OP 7)

- 2 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.

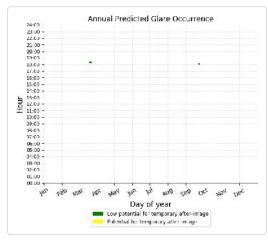


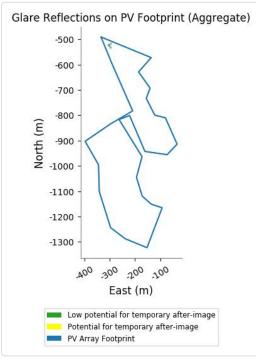


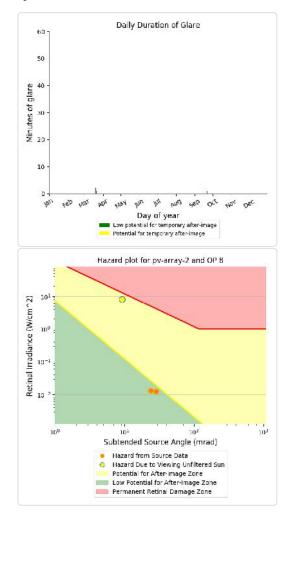


#### PV array 2 - OP Receptor (OP 8)

- 4 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.

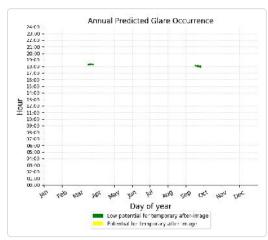


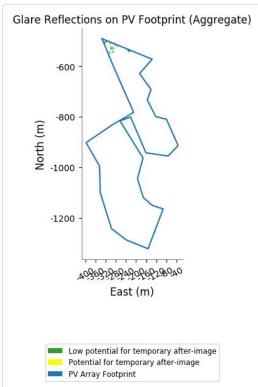


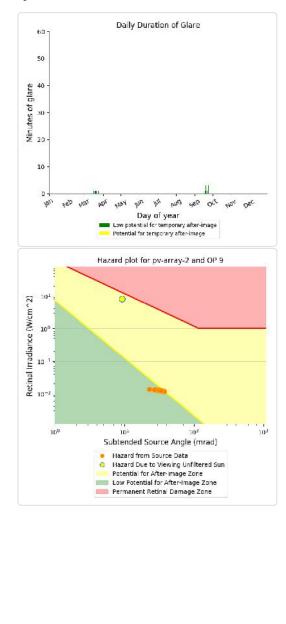


#### PV array 2 - OP Receptor (OP 9)

- 14 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.



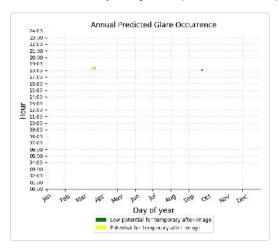


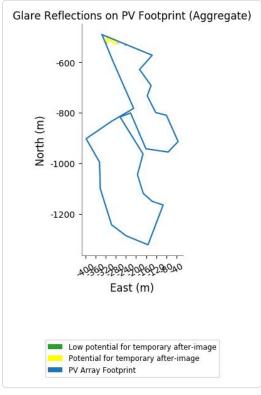


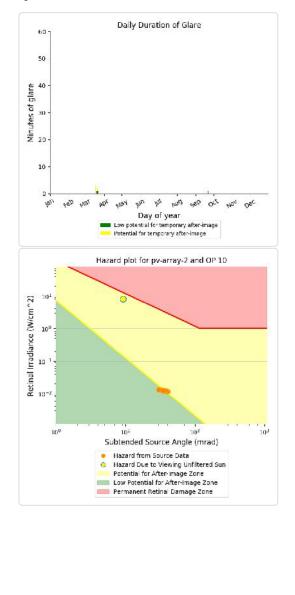
#### PV array 2 - OP Receptor (OP 10)

PV array is expected to produce the following glare for receptors at this location:

- 4 minutes of "green" glare with low potential to cause temporary after-image.
- 4 minutes of "yellow" glare with potential to cause temporary after-image.







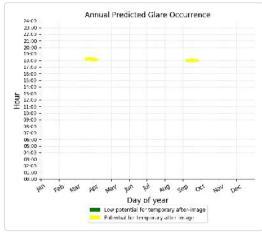
#### PV array 2 - OP Receptor (OP 11)

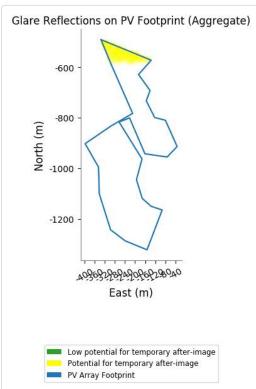
No glare found

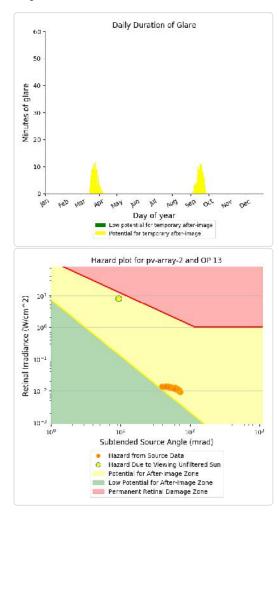
#### PV array 2 - OP Receptor (OP 12)

#### PV array 2 - OP Receptor (OP 13)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 276 minutes of "yellow" glare with potential to cause temporary after-image.

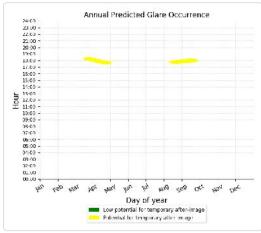


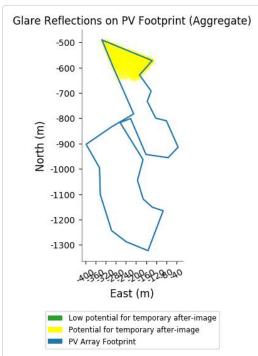


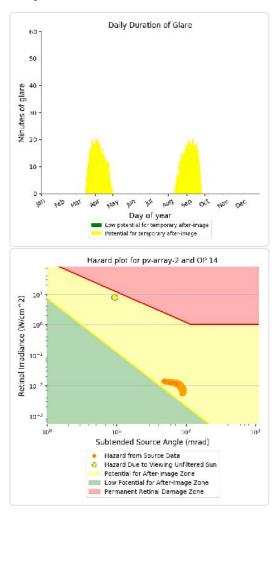


#### PV array 2 - OP Receptor (OP 14)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,269 minutes of "yellow" glare with potential to cause temporary after-image.

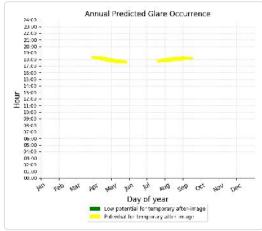


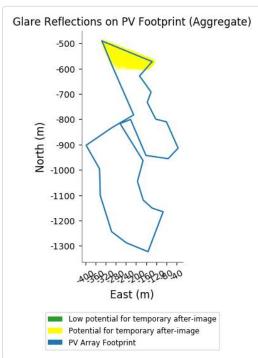


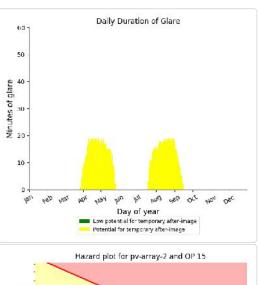


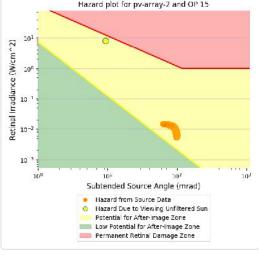
#### PV array 2 - OP Receptor (OP 15)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,733 minutes of "yellow" glare with potential to cause temporary after-image.





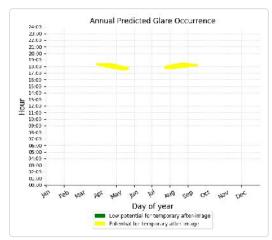


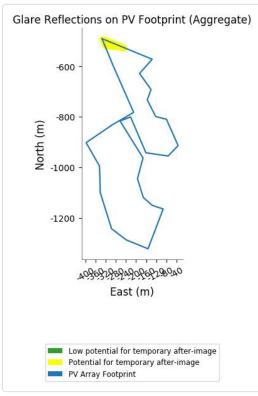


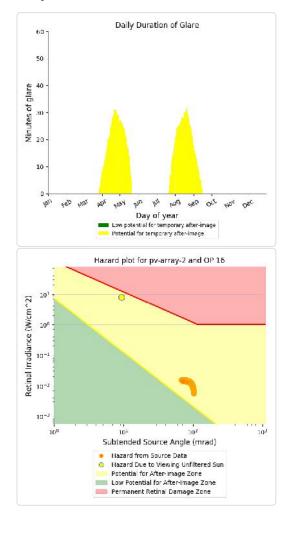
#### PV array 2 - OP Receptor (OP 16)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,159 minutes of "yellow" glare with potential to cause temporary after-image.



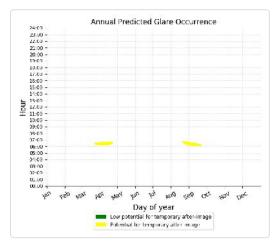


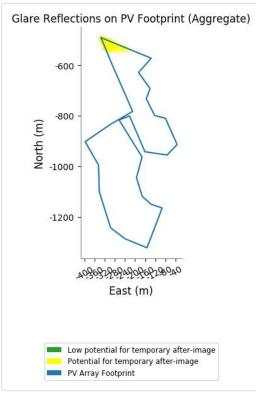


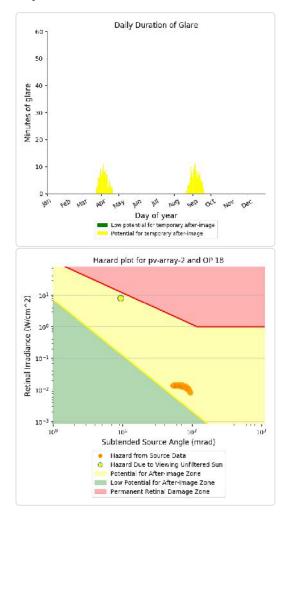
PV array 2 - OP Receptor (OP 17)

## PV array 2 - OP Receptor (OP 18)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 327 minutes of "yellow" glare with potential to cause temporary after-image.



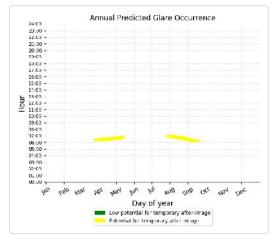


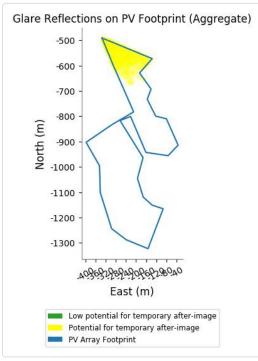


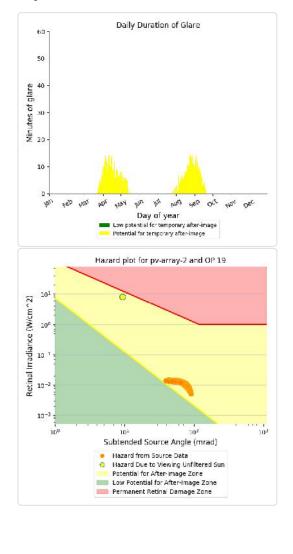
## PV array 2 - OP Receptor (OP 19)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 820 minutes of "yellow" glare with potential to cause temporary after-image.







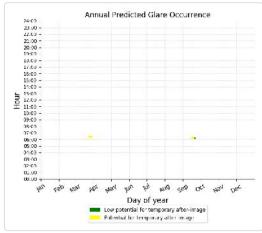
PV array 2 - OP Receptor (OP 20)

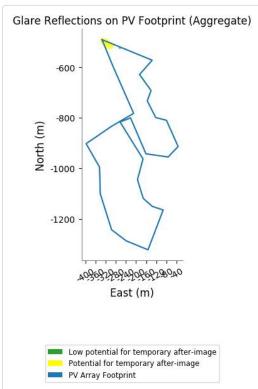
No glare found

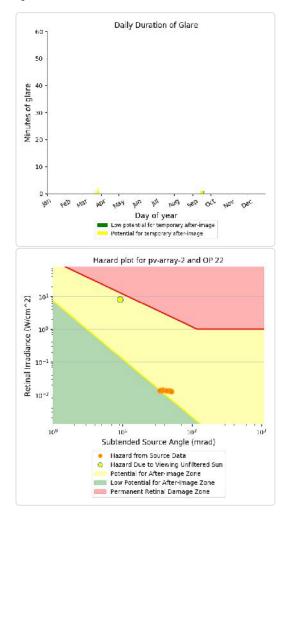
## PV array 2 - OP Receptor (OP 21)

## PV array 2 - OP Receptor (OP 22)

- 1 minutes of "green" glare with low potential to cause temporary after-image.
- 9 minutes of "yellow" glare with potential to cause temporary after-image.

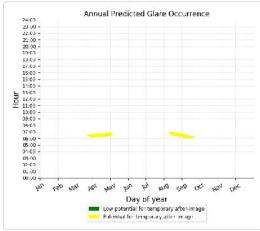


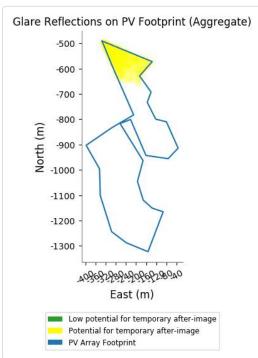


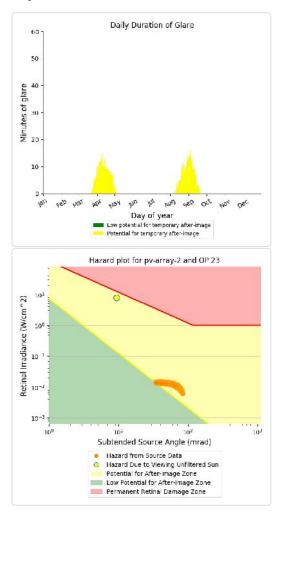


## PV array 2 - OP Receptor (OP 23)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 651 minutes of "yellow" glare with potential to cause temporary after-image.

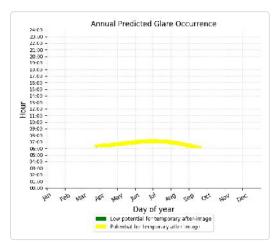


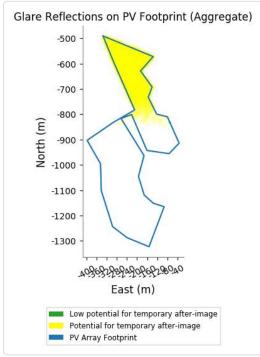


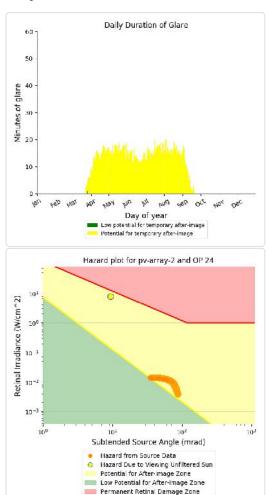


## PV array 2 - OP Receptor (OP 24)

- 1 minutes of "green" glare with low potential to cause temporary after-image.
- 2,549 minutes of "yellow" glare with potential to cause temporary after-image.





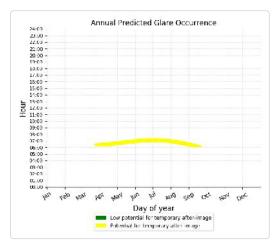


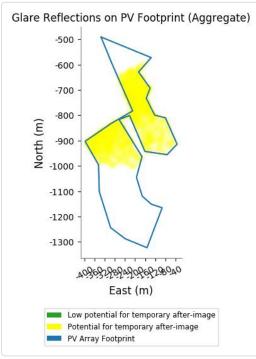
10-3

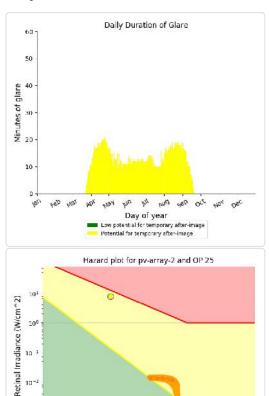
## PV array 2 - OP Receptor (OP 25)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,441 minutes of "yellow" glare with potential to cause temporary after-image.







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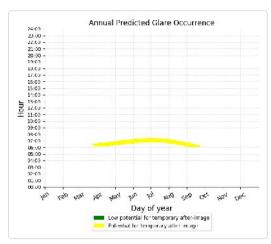
Subtended Source Angle (mrad)
Hazard from Source Data

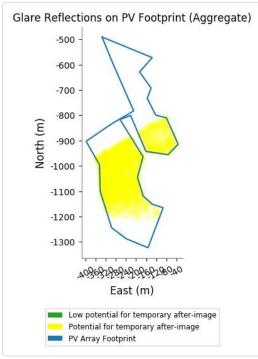
Permanent Retinal Damage Zone

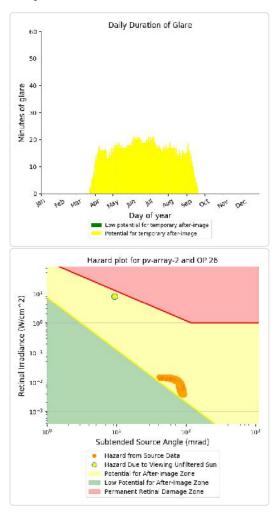
Hazard Due to Viewing Unfiltered Sun Potential for After-Image Zone Low Potential for After-Image Zone

## PV array 2 - OP Receptor (OP 26)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,896 minutes of "yellow" glare with potential to cause temporary after-image.

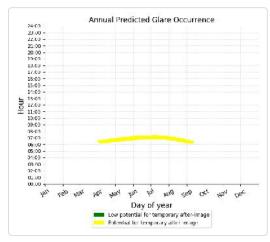


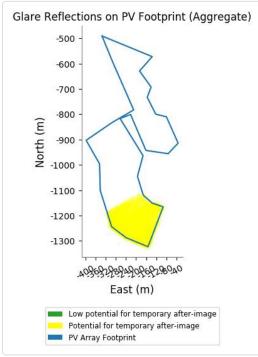


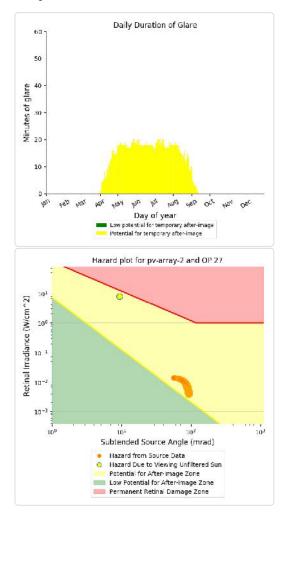


## PV array 2 - OP Receptor (OP 27)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,458 minutes of "yellow" glare with potential to cause temporary after-image.



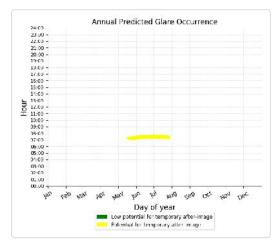


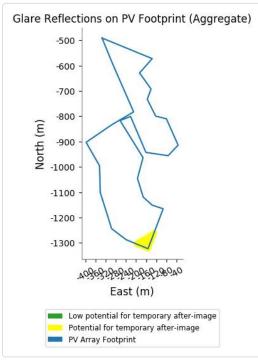


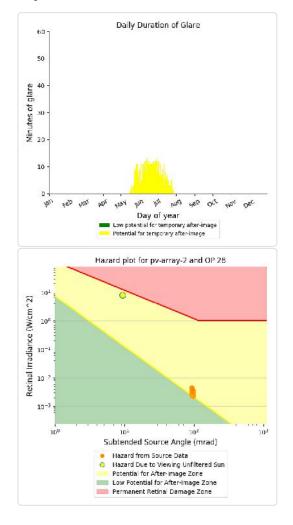
#### PV array 2 - OP Receptor (OP 28)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 575 minutes of "yellow" glare with potential to cause temporary after-image.







## PV array 2 - OP Receptor (OP 29)

No glare found

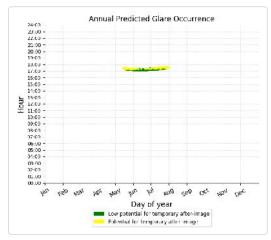
PV array 2 - OP Receptor (OP 30)

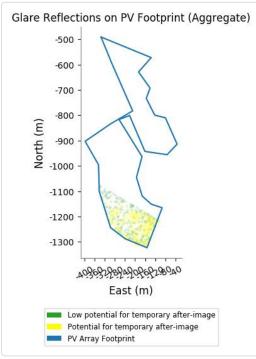
No glare found

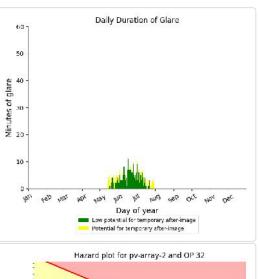
PV array 2 - OP Receptor (OP 31)

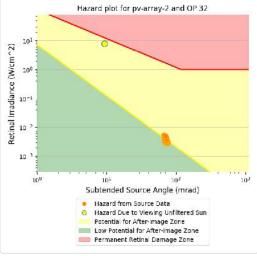
## PV array 2 - OP Receptor (OP 32)

- 266 minutes of "green" glare with low potential to cause temporary after-image.
- 100 minutes of "yellow" glare with potential to cause temporary after-image.



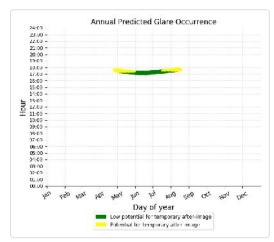


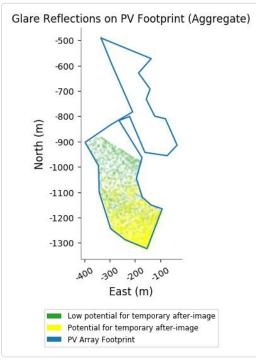


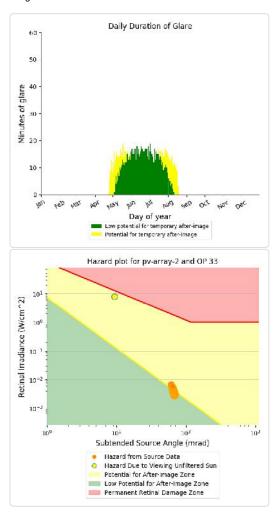


## PV array 2 - OP Receptor (OP 33)

- 1,234 minutes of "green" glare with low potential to cause temporary after-image.
- 441 minutes of "yellow" glare with potential to cause temporary after-image.

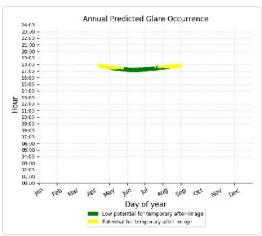


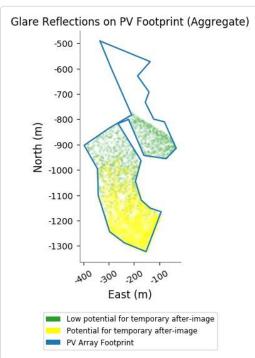


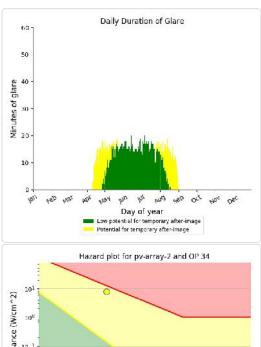


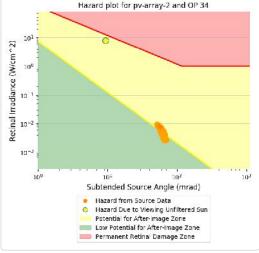
## PV array 2 - OP Receptor (OP 34)

- 1,487 minutes of "green" glare with low potential to cause temporary after-image.
- 665 minutes of "yellow" glare with potential to cause temporary after-image.



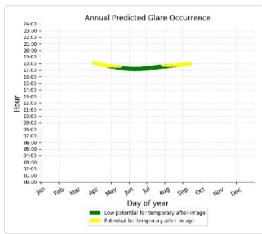


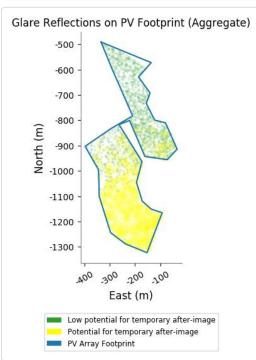


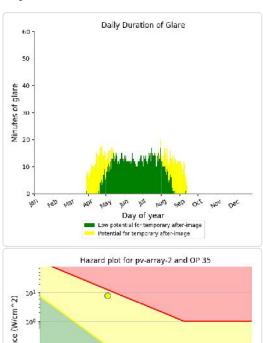


## PV array 2 - OP Receptor (OP 35)

- 1,329 minutes of "green" glare with low potential to cause temporary after-image.
- 763 minutes of "yellow" glare with potential to cause temporary after-image.







# PV array 3 potential temporary after-image



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
OP: OP 7	441	1107
OP: OP 8	157	2154
OP: OP 9	58	3693
OP: OP 10	1220	6988
OP: OP 11	0	1230
OP: OP 12	5833	9784
OP: OP 13	1495	2082
OP: OP 14	18	2099
OP: OP 15	241	3800
OP: OP 16	394	4210
OP: OP 17	199	1736
OP: OP 18	377	1595
OP: OP 19	1695	553
OP: OP 20	0	0
OP: OP 21	330	0
OP: OP 22	1174	0
OP: OP 23	1778	22
OP: OP 24	3297	0
OP: OP 25	2876	0
OP: OP 26	918	0
OP: OP 27	0	0
OP: OP 28	0	0
OP: OP 29	0	0
OP: OP 30	0	0
OP: OP 31	0	0
OP: OP 32	0	0
OP: OP 33	0	0
OP: OP 34	0	0
OP: OP 35	0	0

PV array 3 - OP Receptor (OP 1)

No glare found

PV array 3 - OP Receptor (OP 2)

No glare found

PV array 3 - OP Receptor (OP 3)

#### PV array 3 - OP Receptor (OP 4)

No glare found

#### PV array 3 - OP Receptor (OP 5)

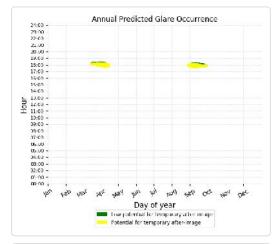
No glare found

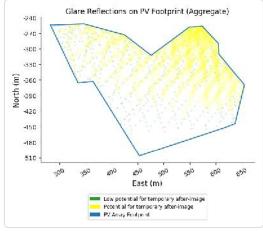
#### PV array 3 - OP Receptor (OP 6)

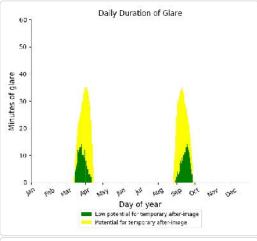
No glare found

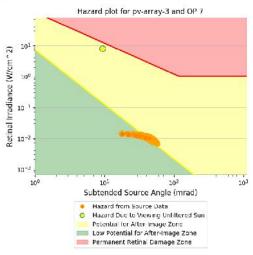
#### PV array 3 - OP Receptor (OP 7)

- 441 minutes of "green" glare with low potential to cause temporary after-image.
- 1,107 minutes of "yellow" glare with potential to cause temporary after-image.



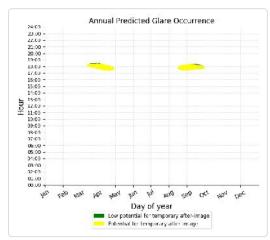


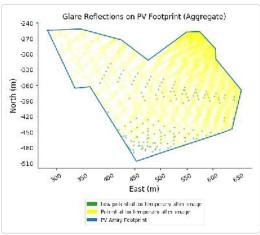


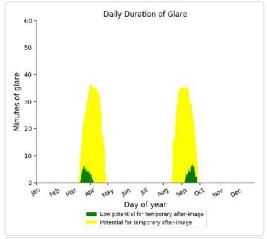


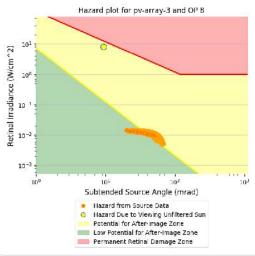
## PV array 3 - OP Receptor (OP 8)

- 157 minutes of "green" glare with low potential to cause temporary after-image.
- 2,154 minutes of "yellow" glare with potential to cause temporary after-image.



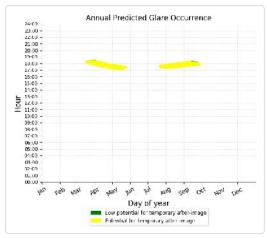


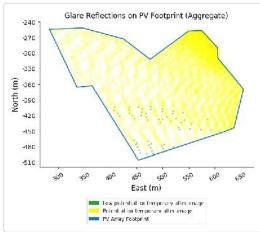


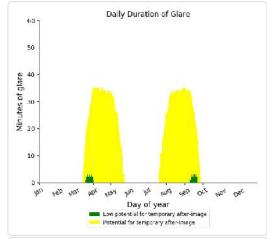


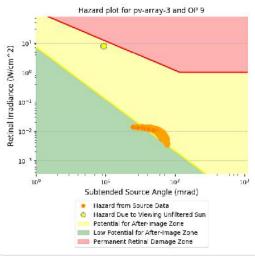
## PV array 3 - OP Receptor (OP 9)

- 58 minutes of "green" glare with low potential to cause temporary after-image.
- 3,693 minutes of "yellow" glare with potential to cause temporary after-image.



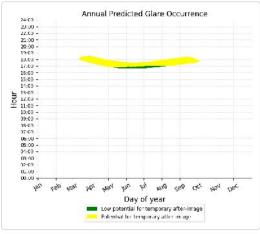


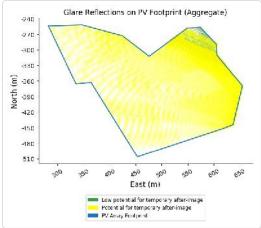


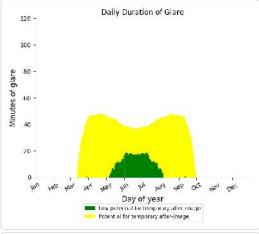


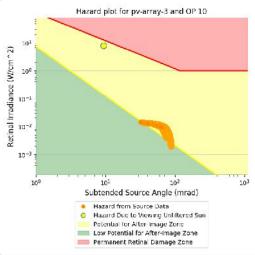
## PV array 3 - OP Receptor (OP 10)

- 1,220 minutes of "green" glare with low potential to cause temporary after-image.
- 6,988 minutes of "yellow" glare with potential to cause temporary after-image.



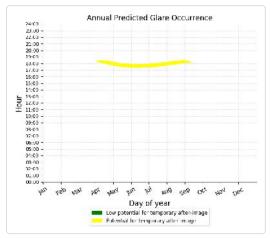


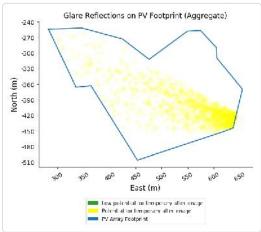


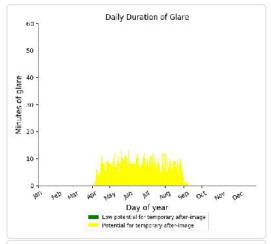


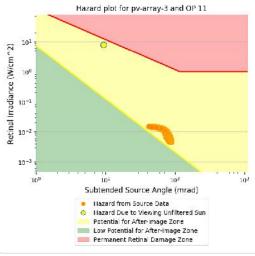
## PV array 3 - OP Receptor (OP 11)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,230 minutes of "yellow" glare with potential to cause temporary after-image.



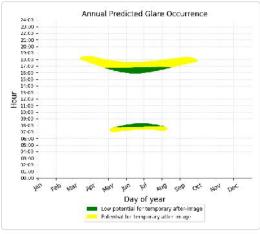


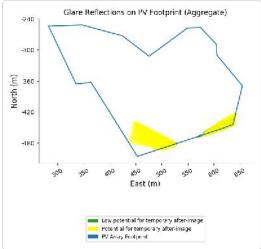


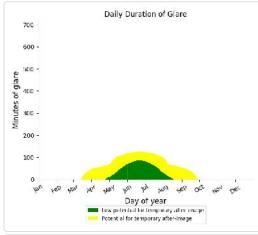


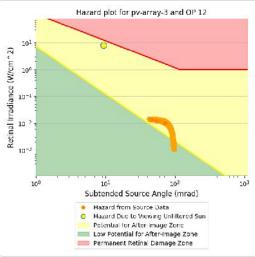
## PV array 3 - OP Receptor (OP 12)

- 5,833 minutes of "green" glare with low potential to cause temporary after-image.
- 9,784 minutes of "yellow" glare with potential to cause temporary after-image.



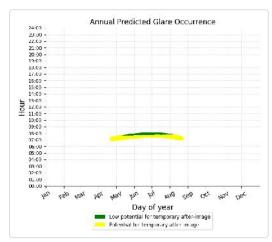


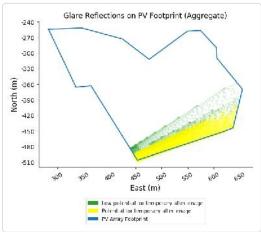


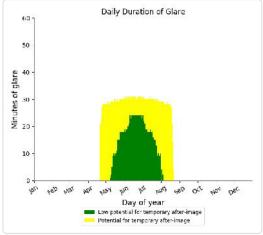


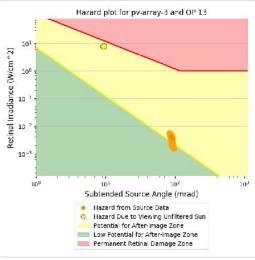
## PV array 3 - OP Receptor (OP 13)

- 1,495 minutes of "green" glare with low potential to cause temporary after-image.
- 2,082 minutes of "yellow" glare with potential to cause temporary after-image.



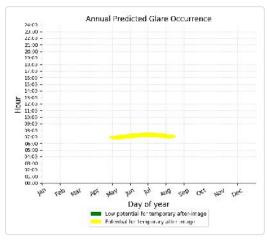


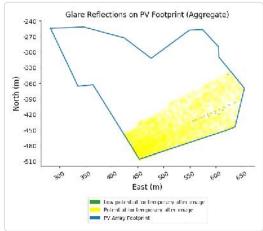


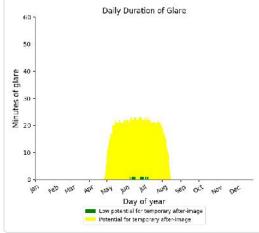


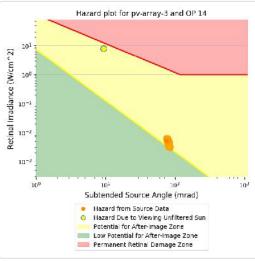
## PV array 3 - OP Receptor (OP 14)

- 18 minutes of "green" glare with low potential to cause temporary after-image.
- 2,099 minutes of "yellow" glare with potential to cause temporary after-image.



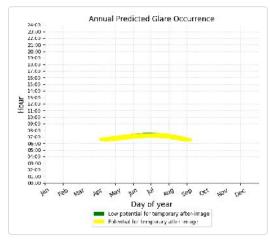


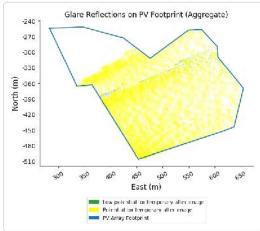


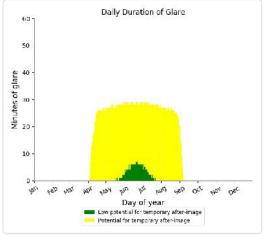


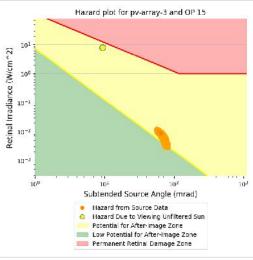
## PV array 3 - OP Receptor (OP 15)

- 241 minutes of "green" glare with low potential to cause temporary after-image.
- 3,800 minutes of "yellow" glare with potential to cause temporary after-image.



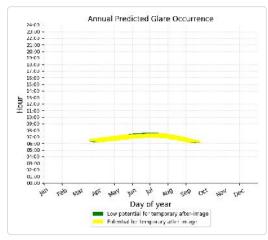


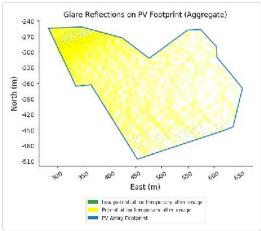


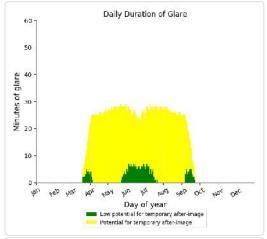


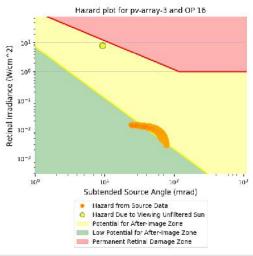
## PV array 3 - OP Receptor (OP 16)

- 394 minutes of "green" glare with low potential to cause temporary after-image.
- 4,210 minutes of "yellow" glare with potential to cause temporary after-image.



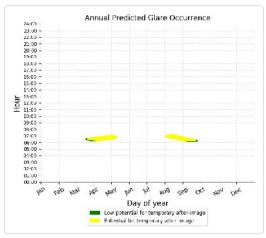


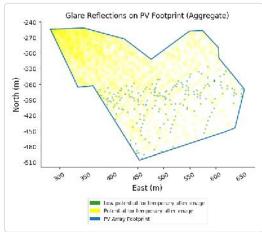


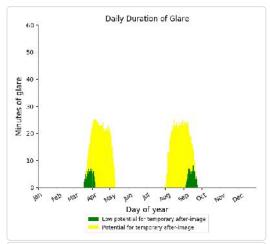


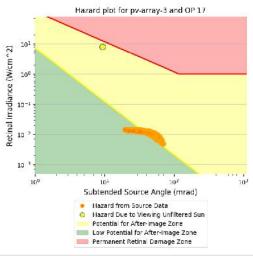
## PV array 3 - OP Receptor (OP 17)

- 199 minutes of "green" glare with low potential to cause temporary after-image.
- 1,736 minutes of "yellow" glare with potential to cause temporary after-image.



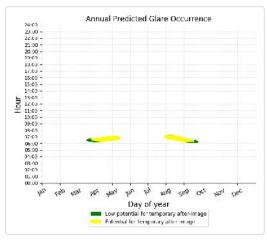


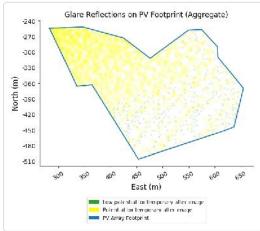


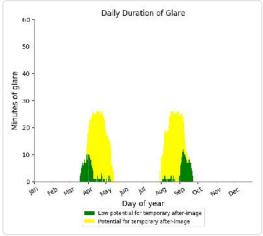


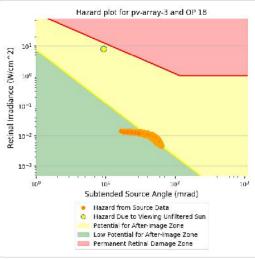
## PV array 3 - OP Receptor (OP 18)

- 377 minutes of "green" glare with low potential to cause temporary after-image.
- 1,595 minutes of "yellow" glare with potential to cause temporary after-image.





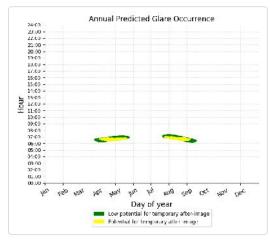


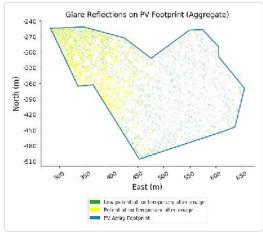


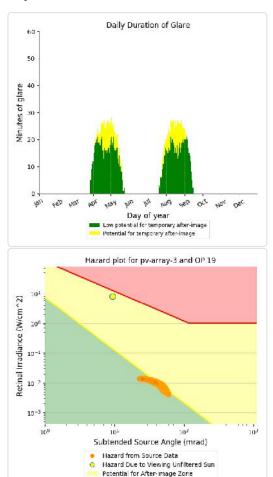
## PV array 3 - OP Receptor (OP 19)

PV array is expected to produce the following glare for receptors at this location:

- 1,695 minutes of "green" glare with low potential to cause temporary after-image.
- 553 minutes of "yellow" glare with potential to cause temporary after-image.





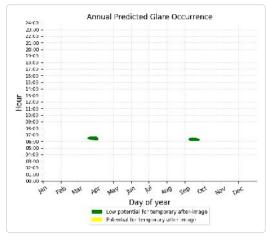


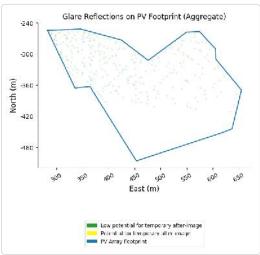
Low Potential for After-Image Zone
Permanent Retinal Damage Zone

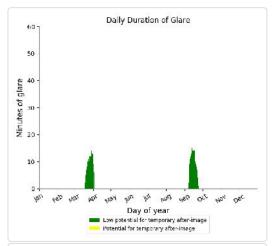
PV array 3 - OP Receptor (OP 20)

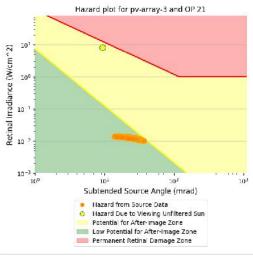
## PV array 3 - OP Receptor (OP 21)

- 330 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.



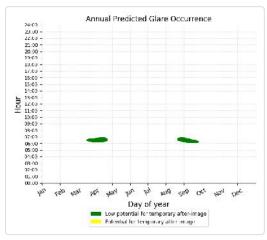


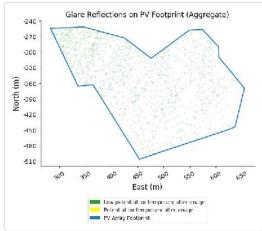


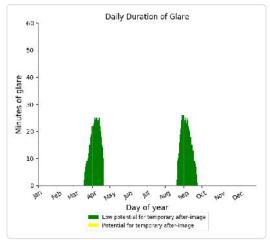


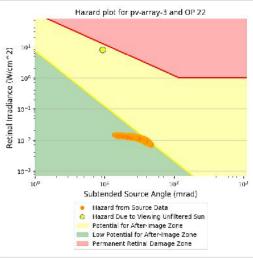
## PV array 3 - OP Receptor (OP 22)

- 1,174 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.



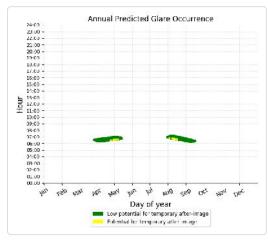


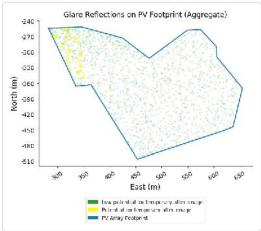


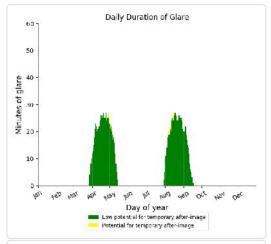


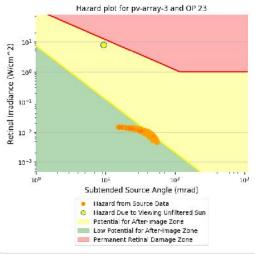
## PV array 3 - OP Receptor (OP 23)

- 1,778 minutes of "green" glare with low potential to cause temporary after-image.
- 22 minutes of "yellow" glare with potential to cause temporary after-image.



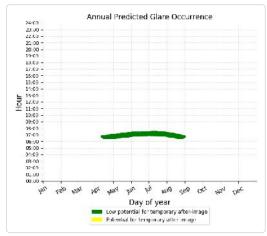


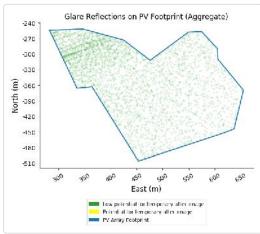


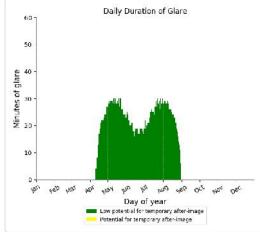


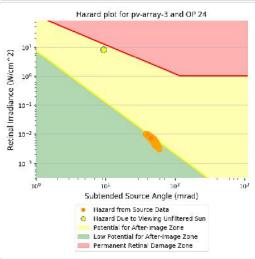
## PV array 3 - OP Receptor (OP 24)

- 3,297 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.



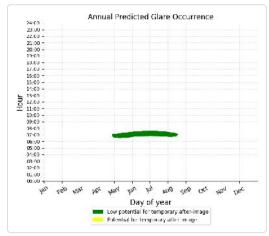


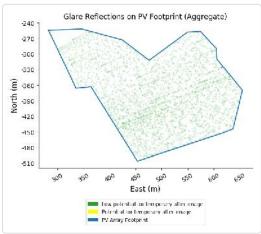


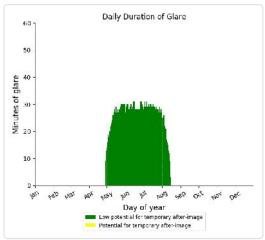


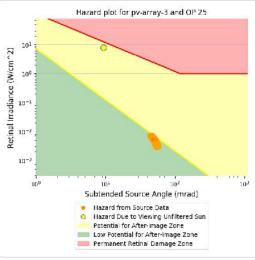
## PV array 3 - OP Receptor (OP 25)

- 2,876 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.





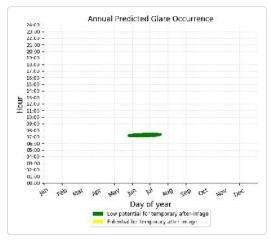


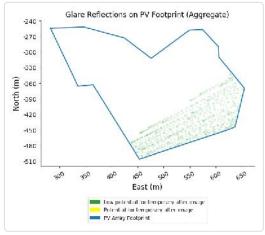


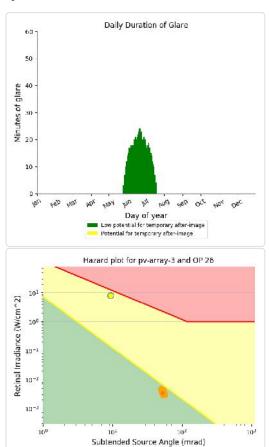
#### PV array 3 - OP Receptor (OP 26)

PV array is expected to produce the following glare for receptors at this location:

- 918 minutes of "green" glare with low potential to cause temporary after-image.
- 0 minutes of "yellow" glare with potential to cause temporary after-image.







Hazard from Source Data

Hazard Due to Viewing Unfiltered Sun
Potential for After-Image Zone
Low Potential for After-Image Zone
Permanent Retinal Damage Zone

PV array 3 - OP Receptor (OP 27)

No glare found

PV array 3 - OP Receptor (OP 28)

No glare found

PV array 3 - OP Receptor (OP 29)

No glare found

PV array 3 - OP Receptor (OP 30)

No glare found

PV array 3 - OP Receptor (OP 31)

No glare found

PV array 3 - OP Receptor (OP 32)

PV array 3 - OP Receptor (OP 33)

No glare found

PV array 3 - OP Receptor (OP 34)

No glare found

PV array 3 - OP Receptor (OP 35)

# PV array 4 potential temporary after-image



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
OP: OP 7	0	0
OP: OP 8	0	52
OP: OP 9	0	269
OP: OP 10	0	339
OP: OP 11	0	0
OP: OP 12	33	6998
OP: OP 13	0	4662
OP: OP 14	0	626
OP: OP 15	0	1202
OP: OP 16	0	380
OP: OP 17	1	74
OP: OP 18	13	272
OP: OP 19	41	694
OP: OP 20	0	0
OP: OP 21	0	0
OP: OP 22	43	41
OP: OP 23	74	540
OP: OP 24	39	1352
OP: OP 25	32	2375
OP: OP 26	14	3886
OP: OP 27	4	3659
OP: OP 28	0	1222
OP: OP 29	378	2036
OP: OP 30	236	1886
OP: OP 31	16	62
OP: OP 32	26	3463
OP: OP 33	490	4978
OP: OP 34	413	5966
OP: OP 35	537	6152

PV array 4 - OP Receptor (OP 1)

No glare found

PV array 4 - OP Receptor (OP 2)

No glare found

PV array 4 - OP Receptor (OP 3)

PV array 4 - OP Receptor (OP 4)

No glare found

PV array 4 - OP Receptor (OP 5)

No glare found

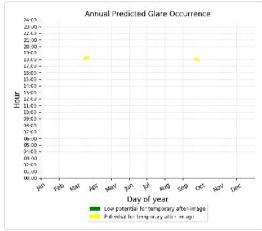
PV array 4 - OP Receptor (OP 6)

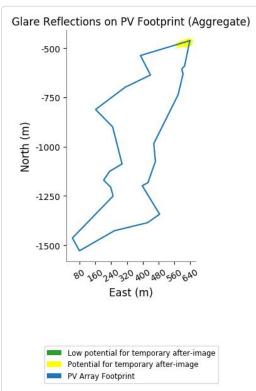
No glare found

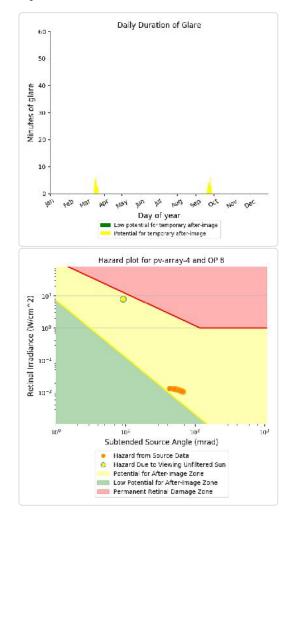
PV array 4 - OP Receptor (OP 7)

# PV array 4 - OP Receptor (OP 8)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 52 minutes of "yellow" glare with potential to cause temporary after-image.

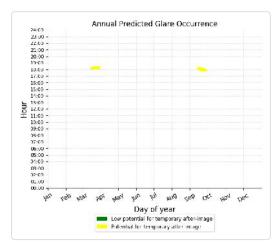


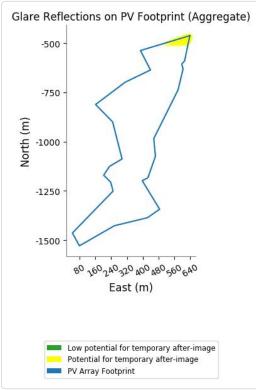


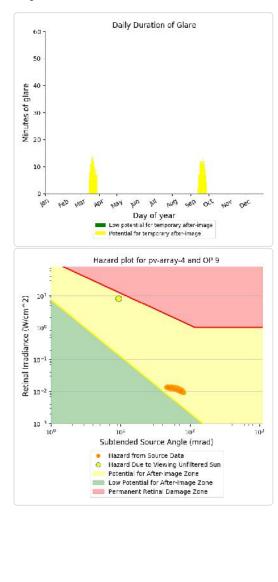


# PV array 4 - OP Receptor (OP 9)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 269 minutes of "yellow" glare with potential to cause temporary after-image.



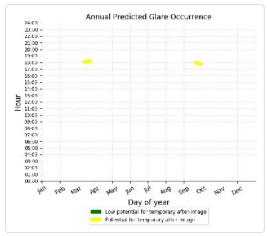


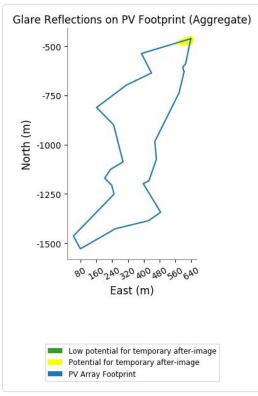


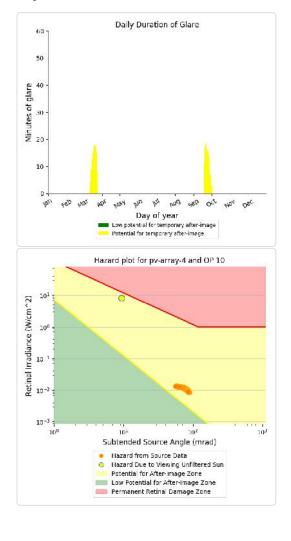
# PV array 4 - OP Receptor (OP 10)

PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 339 minutes of "yellow" glare with potential to cause temporary after-image.





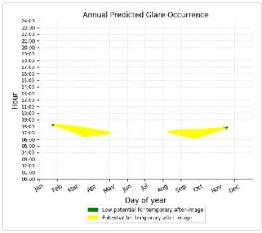


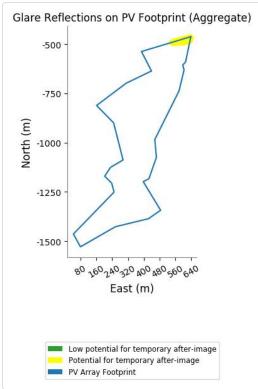
PV array 4 - OP Receptor (OP 11)

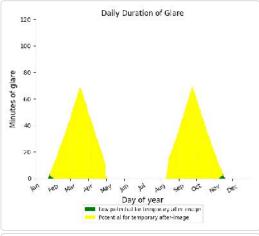
No glare found

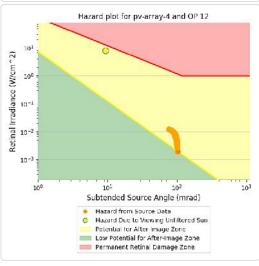
# PV array 4 - OP Receptor (OP 12)

- 33 minutes of "green" glare with low potential to cause temporary after-image.
- 6,998 minutes of "yellow" glare with potential to cause temporary after-image.



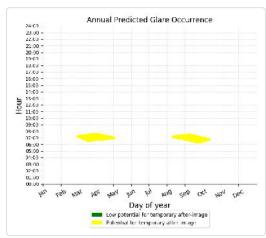


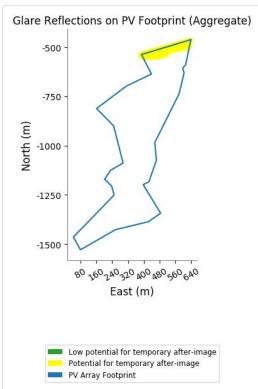


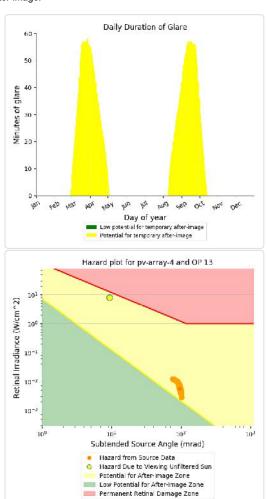


# PV array 4 - OP Receptor (OP 13)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 4,662 minutes of "yellow" glare with potential to cause temporary after-image.

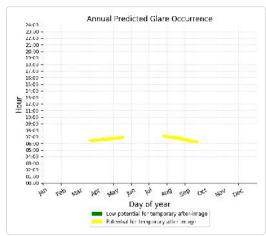


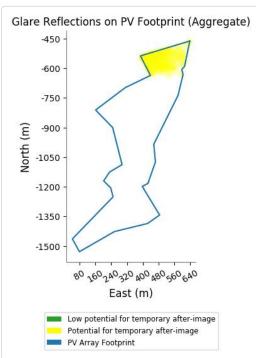


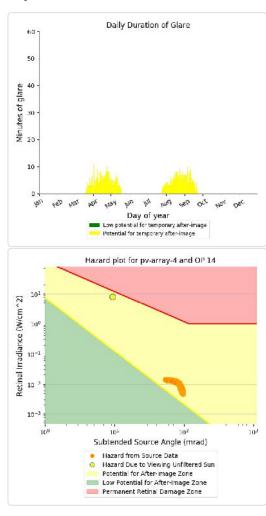


# PV array 4 - OP Receptor (OP 14)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 626 minutes of "yellow" glare with potential to cause temporary after-image.

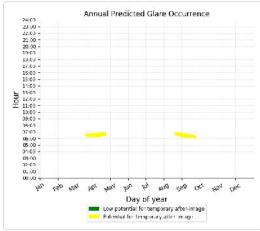


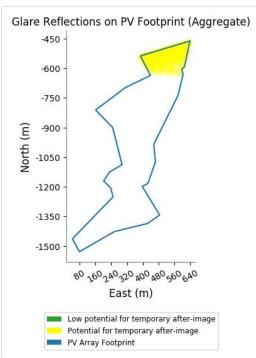


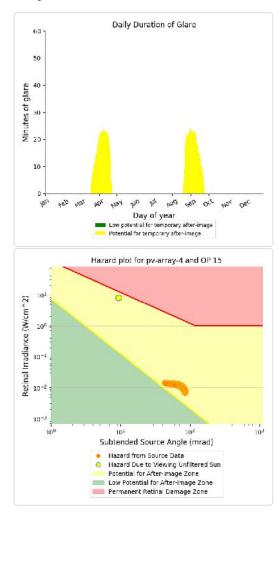


# PV array 4 - OP Receptor (OP 15)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,202 minutes of "yellow" glare with potential to cause temporary after-image.

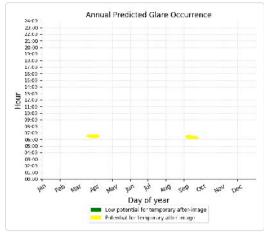


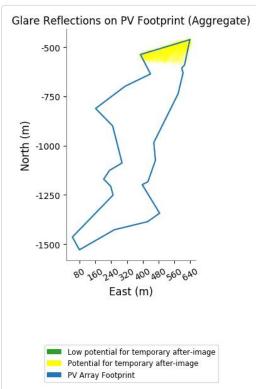


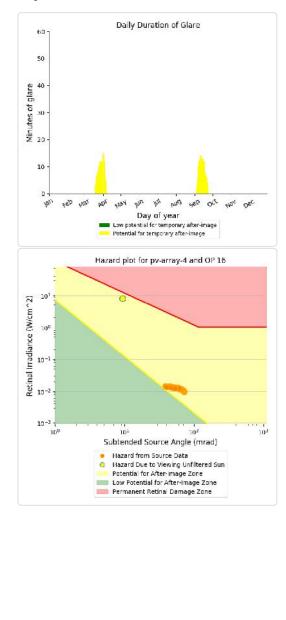


# PV array 4 - OP Receptor (OP 16)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 380 minutes of "yellow" glare with potential to cause temporary after-image.

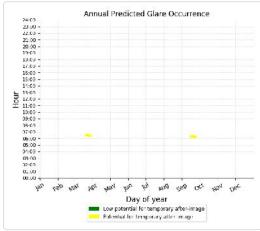


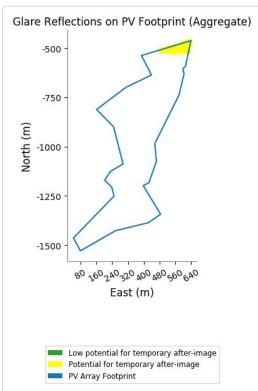


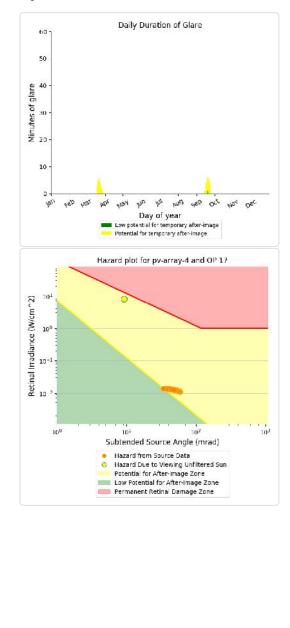


# PV array 4 - OP Receptor (OP 17)

- 1 minutes of "green" glare with low potential to cause temporary after-image.
- 74 minutes of "yellow" glare with potential to cause temporary after-image.

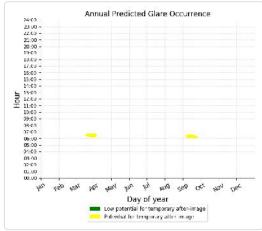


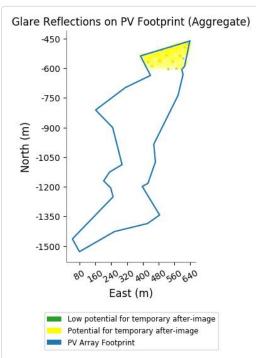


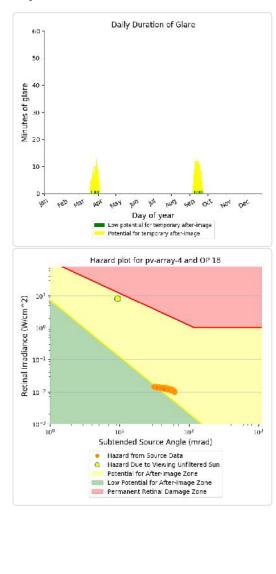


# PV array 4 - OP Receptor (OP 18)

- 13 minutes of "green" glare with low potential to cause temporary after-image.
- 272 minutes of "yellow" glare with potential to cause temporary after-image.



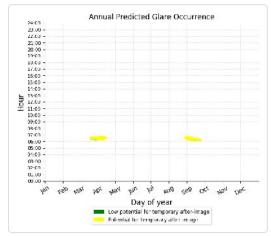


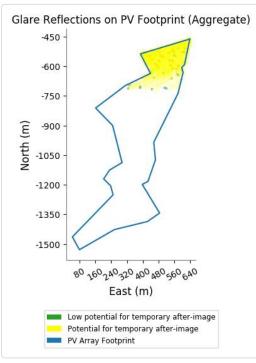


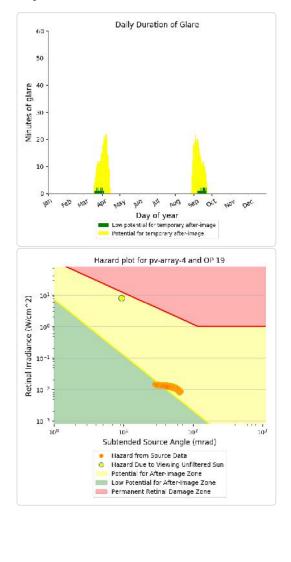
## PV array 4 - OP Receptor (OP 19)

PV array is expected to produce the following glare for receptors at this location:

- 41 minutes of "green" glare with low potential to cause temporary after-image.
- 694 minutes of "yellow" glare with potential to cause temporary after-image.







PV array 4 - OP Receptor (OP 20)

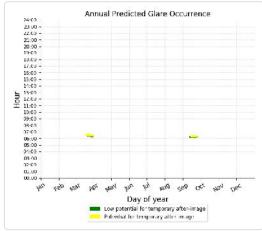
No glare found

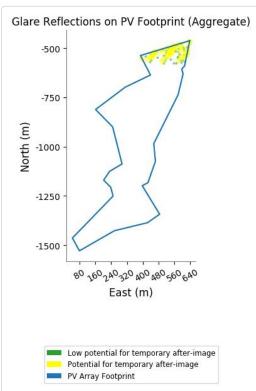
# PV array 4 - OP Receptor (OP 21)

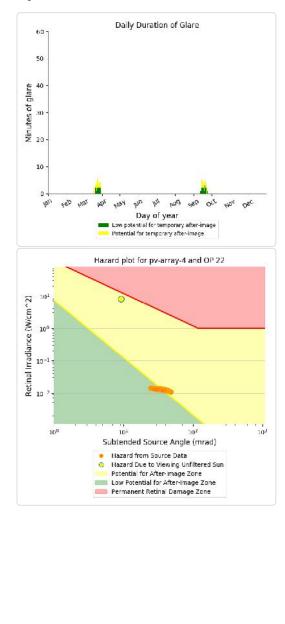
No glare found

# PV array 4 - OP Receptor (OP 22)

- 43 minutes of "green" glare with low potential to cause temporary after-image.
- 41 minutes of "yellow" glare with potential to cause temporary after-image.

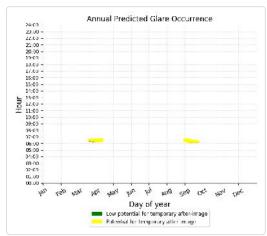


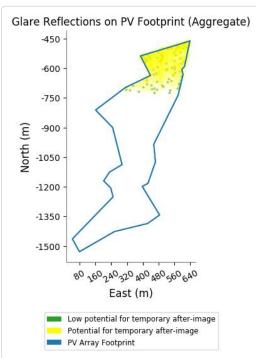


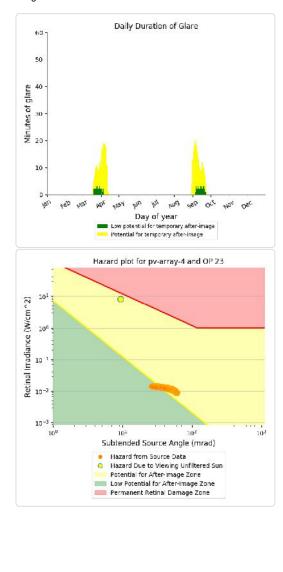


# PV array 4 - OP Receptor (OP 23)

- 74 minutes of "green" glare with low potential to cause temporary after-image.
- 540 minutes of "yellow" glare with potential to cause temporary after-image.

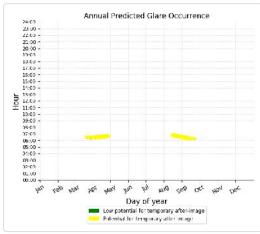


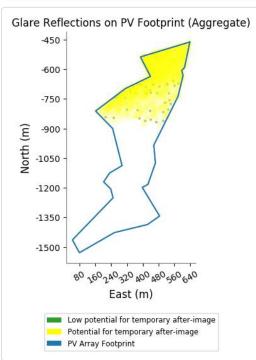


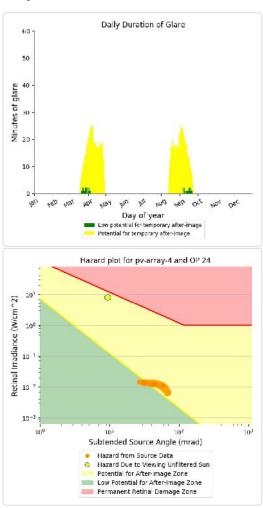


# PV array 4 - OP Receptor (OP 24)

- 39 minutes of "green" glare with low potential to cause temporary after-image.
- 1,352 minutes of "yellow" glare with potential to cause temporary after-image.



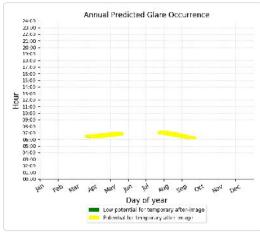


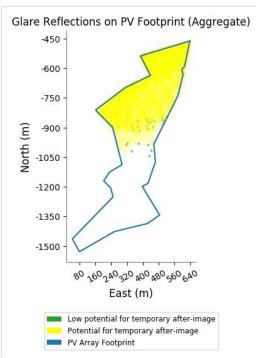


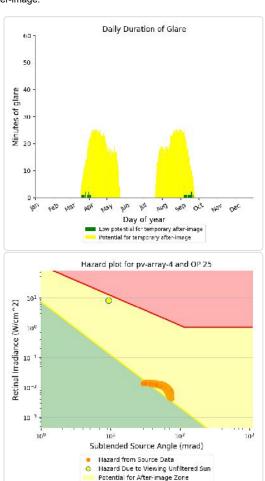
# PV array 4 - OP Receptor (OP 25)

PV array is expected to produce the following glare for receptors at this location:

- 32 minutes of "green" glare with low potential to cause temporary after-image.
- 2,375 minutes of "yellow" glare with potential to cause temporary after-image.





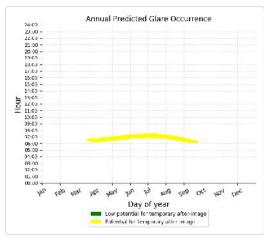


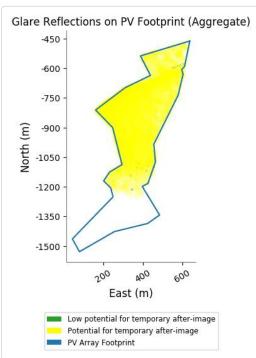
Low Potential for After-Image Zone

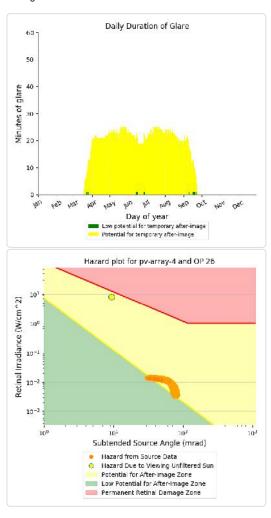
Permanent Retinal Damage Zone

# PV array 4 - OP Receptor (OP 26)

- 14 minutes of "green" glare with low potential to cause temporary after-image.
- 3,886 minutes of "yellow" glare with potential to cause temporary after-image.

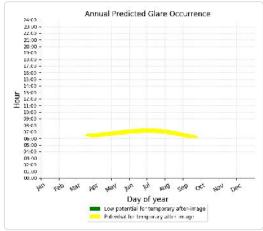


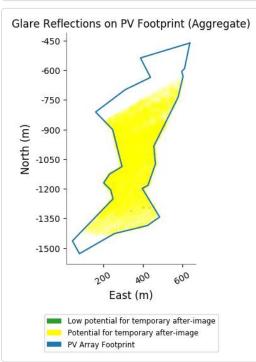


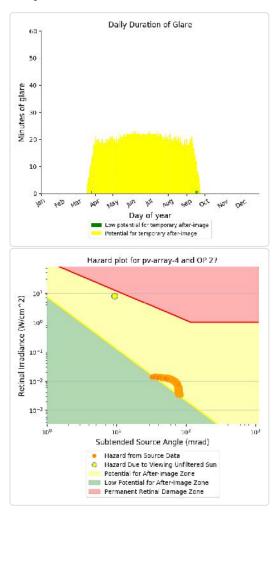


# PV array 4 - OP Receptor (OP 27)

- 4 minutes of "green" glare with low potential to cause temporary after-image.
- 3,659 minutes of "yellow" glare with potential to cause temporary after-image.

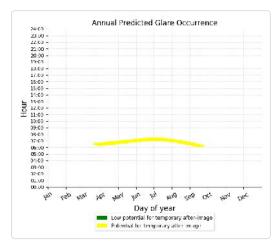


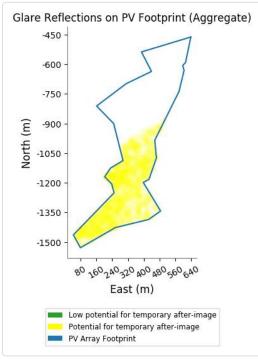


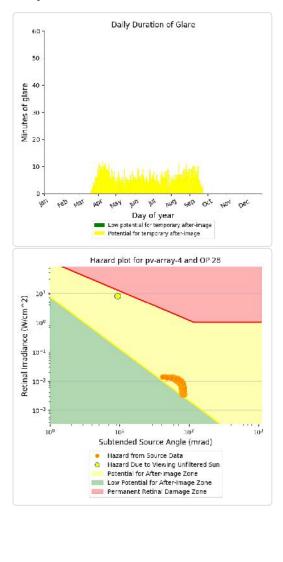


# PV array 4 - OP Receptor (OP 28)

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,222 minutes of "yellow" glare with potential to cause temporary after-image.



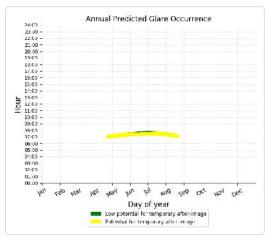


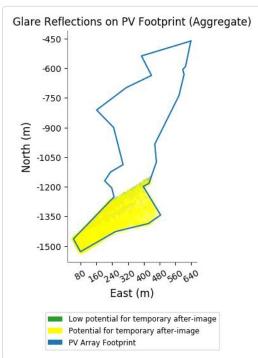


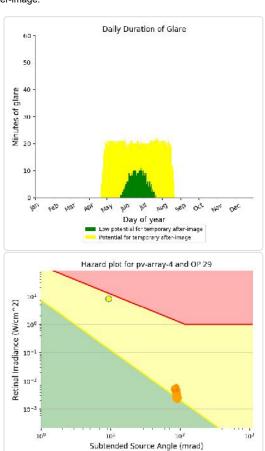
# PV array 4 - OP Receptor (OP 29)

PV array is expected to produce the following glare for receptors at this location:

- 378 minutes of "green" glare with low potential to cause temporary after-image.
- 2,036 minutes of "yellow" glare with potential to cause temporary after-image.







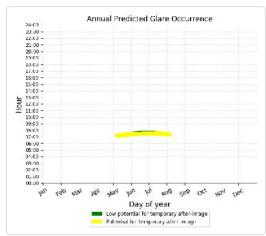
Hazard from Source Data

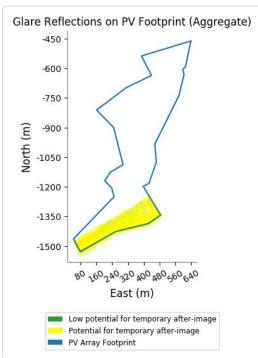
Permanent Retinal Damage Zone

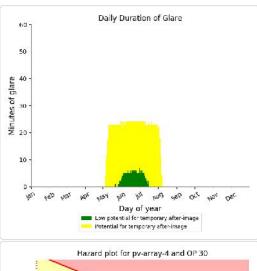
Hazard Due to Viewing Unfiltered Sun Potential for After-Image Zone Low Potential for After-Image Zone

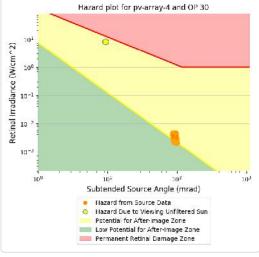
# PV array 4 - OP Receptor (OP 30)

- 236 minutes of "green" glare with low potential to cause temporary after-image.
- 1,886 minutes of "yellow" glare with potential to cause temporary after-image.



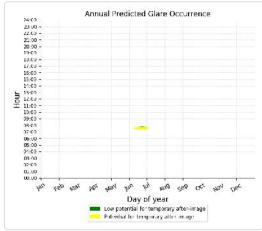


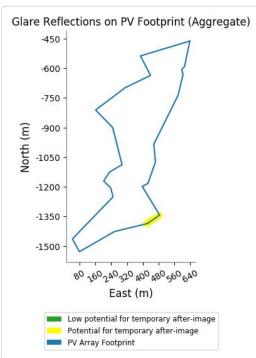


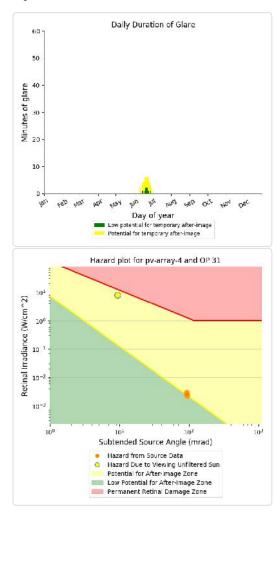


# PV array 4 - OP Receptor (OP 31)

- 16 minutes of "green" glare with low potential to cause temporary after-image.
- 62 minutes of "yellow" glare with potential to cause temporary after-image.

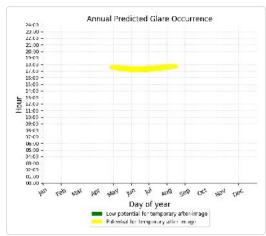


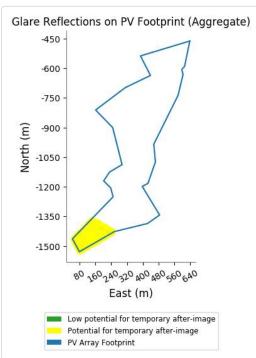


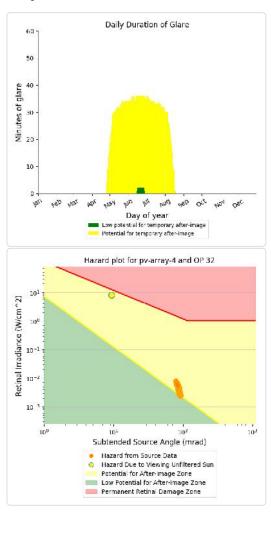


# PV array 4 - OP Receptor (OP 32)

- 26 minutes of "green" glare with low potential to cause temporary after-image.
- 3,463 minutes of "yellow" glare with potential to cause temporary after-image.

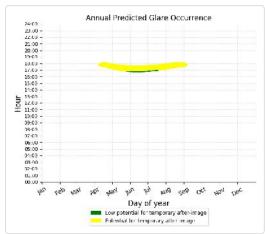


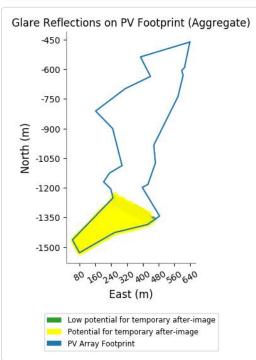


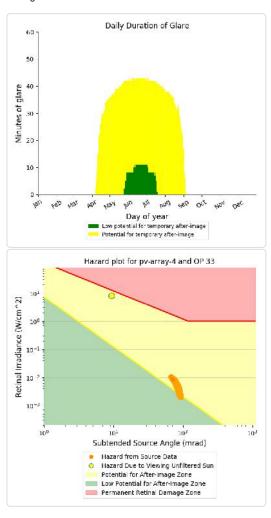


# PV array 4 - OP Receptor (OP 33)

- 490 minutes of "green" glare with low potential to cause temporary after-image.
- 4,978 minutes of "yellow" glare with potential to cause temporary after-image.



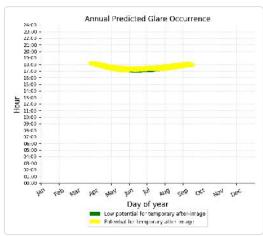


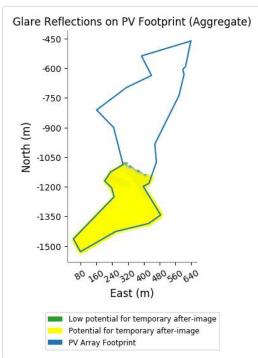


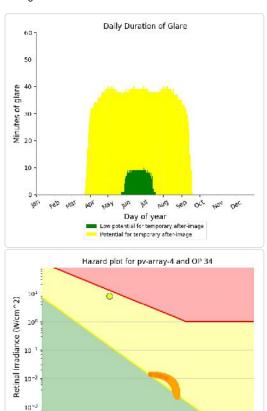
# PV array 4 - OP Receptor (OP 34)

PV array is expected to produce the following glare for receptors at this location:

- 413 minutes of "green" glare with low potential to cause temporary after-image.
- 5,966 minutes of "yellow" glare with potential to cause temporary after-image.







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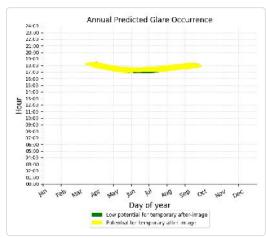
Subtended Source Angle (mrad)
Hazard from Source Data

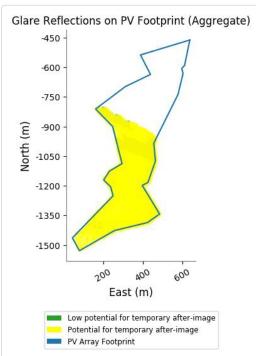
Permanent Retinal Damage Zone

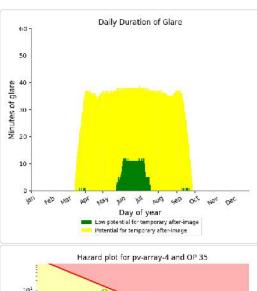
Hazard Due to Viewing Unfiltered Sun Potential for After-Image Zone Low Potential for After-Image Zone

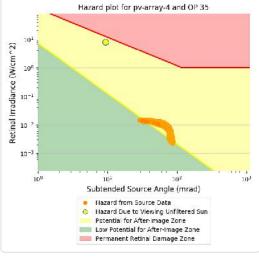
# PV array 4 - OP Receptor (OP 35)

- 537 minutes of "green" glare with low potential to cause temporary after-image.
- 6,152 minutes of "yellow" glare with potential to cause temporary after-image.









# Assumptions

- 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.
- · 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 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large 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, not discrete, spectrum.
- · Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
- Glare analysis methods used: OP V1, FP V1, Route V1
- · Refer to the Help page for assumptions and limitations not listed here.