Appendix G. Solar Glare Analysis Report

Solar Glare Analysis Report

South Fork Solar Project

Nicholas County, Kentucky

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1.0 PROJECT OVERVIEW

South Fork Solar, LLC (the Applicant) is proposing to construct the South Fork Solar Project, an up to 45 megawatt (MW) solar-powered electric generation facility located in Nicholas County, Kentucky (hereafter referred to as the Facility; see Figure 1). This report provides an assessment of the potential for reflected glare and glint from the proposed photovoltaic (PV) arrays to be experienced at receptors (residences, commercial buildings, etc.), airports, and roadways located near the proposed Facility.

The Applicant is proposing the use of single-axis tracking PV arrays. Each PV array will be comprised of linear rows of PV modules mounted on trackers, which will be oriented in a north-south direction and equipped with electric motors that slowly rotate the PV modules to track the movement of the sun and minimize the angle of incidence between the sun and the array. Based on the preliminary site plan and equipment specifications, the PV arrays will use interval backtracking and have a resting angle of 5 degrees with a maximum tracking angle of 60 degrees. The height of the arrays will vary as the structures tilt to follow the sun throughout the day. At their tallest position, the PV modules will reach a height of up to 10 feet from the ground surface. For this analysis, the PV arrays were grouped into 10 named PV array areas that cover a total of approximately 308 acres of land within the Facility site (Figure 2).

Topography in the vicinity of the Facility is characterized by relatively hilly terrain, with elevations ranging from about 750 feet to 970 feet above mean sea level. Land cover is defined predominantly by agricultural land interspersed with woodlots and rural residential development.

Figure 1. Regional Facility Location

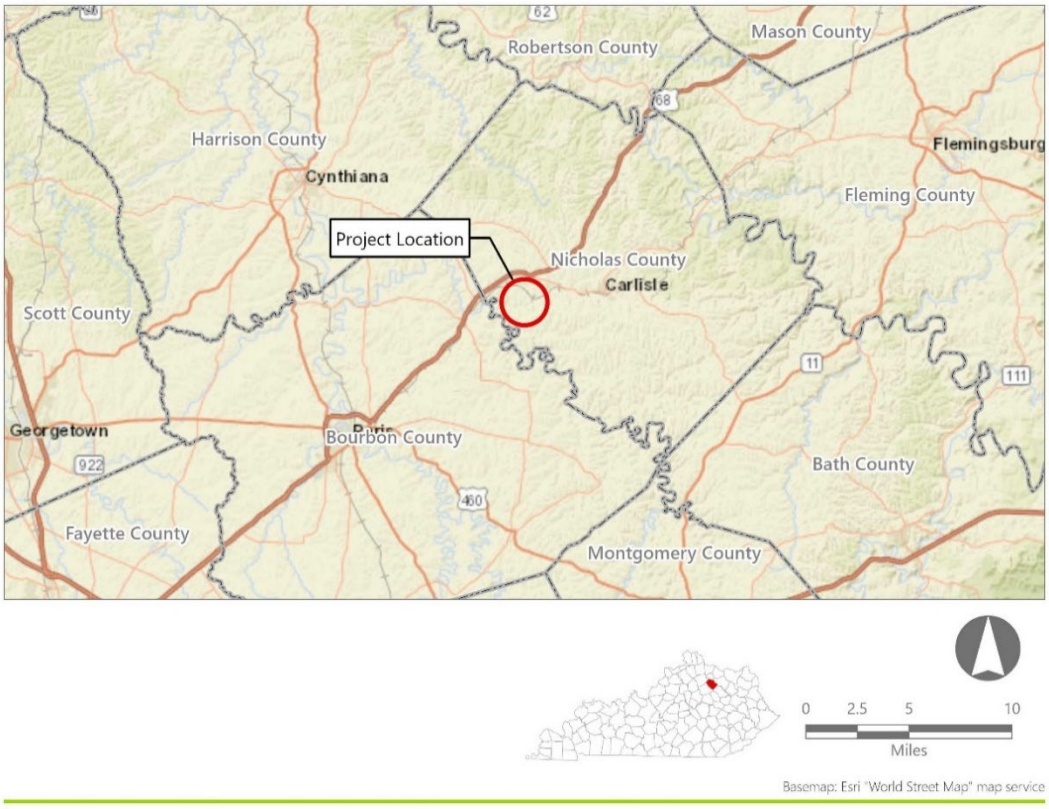
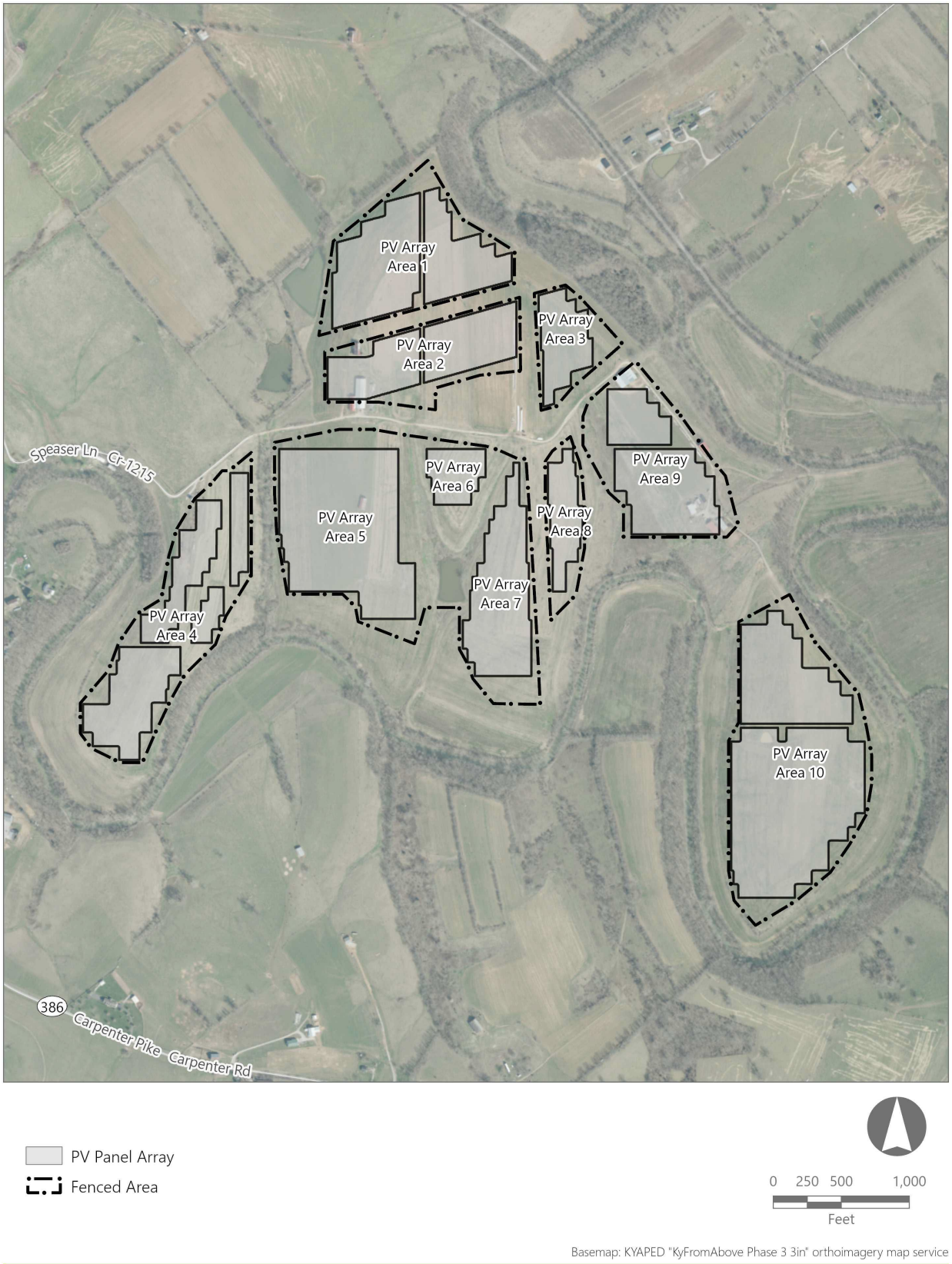


Figure 2. Proposed Facility Layout



2.0 BACKGROUND

Glare and glint are closely related, but distinct, solar experiences. Glare is defined as a continuous source of bright light, whereas glint is defined as a momentary flash of bright light. Both glint and glare are common in the existing environment. The sun and artificial light sources can cause glare or glint either directly (such as from a sunset when driving westbound) or indirectly (such as from the sun's reflection off a lake or glass window). Glare can be received by observers that are either stationary or moving, whereas glint is generally possible only when the observer is moving rapidly, as is often the case with motorists and aviators. As an example, a motorist traveling along a lake with a forested shoreline may have only brief glimpses of sunlight reflected off of the water at sunset (i.e., glint), whereas an adjacent home with visibility of the water through a break in the foliage may have a continuous source of bright light when sunlight strikes the water at a certain angle (i.e., glare).

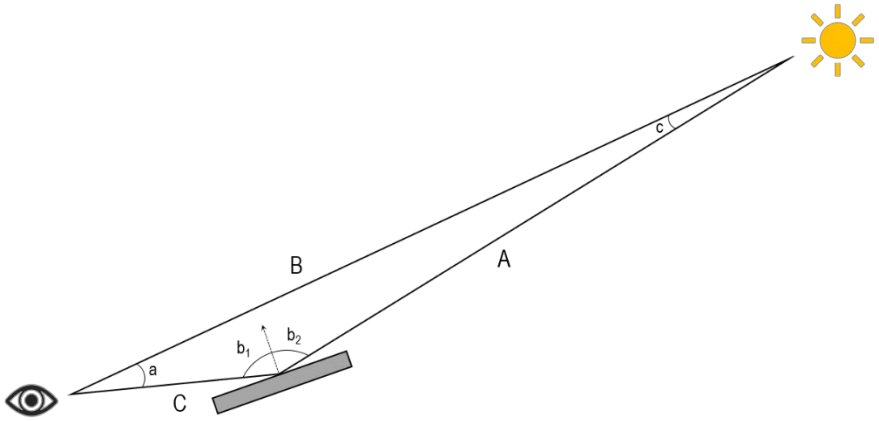
Although less pronounced when compared to glare, the effects of glint are similar and have been conservatively treated the same in all analyses presented in this report. Accordingly, reflected light from the PV arrays is collectively referred to as glare in the remainder of this report. Additional terms used throughout this report are defined as follows.

Direct Normal Irradiance (DNI):	The amount of solar radiation received per unit area by a surface that is always held perpendicular to the rays that come in a straight line from the sun at its current position in the sky.
Diffuse Solar Radiation:	Solar radiation scattered by molecules and particles in the atmosphere.
Direct Solar Radiation:	Solar radiation that has travelled from the sun to the earth's surface in a straight line without scattering. Direct radiation is the component of solar radiation that causes visible glare from flat-plate PV systems.
Glare:	A source of bright reflected light.
Incidence Angle:	The angle between the direct component of insolation (i.e., the sun) and a ray perpendicular to the PV module.
PV Modules:	Flat-plate photovoltaic panels that convert solar radiation to electricity.
PV Array:	A contiguous group of PV modules that are fixed to a ground-mounted racking system and enclosed by security fencing. A single-axis tracking system is proposed for this Facility.
Receptor:	The viewer experiencing glare. For this assessment, receptors are represented by places of habitation (residences) and travel (public roads).
Specular Reflection:	The mirror-like reflection of waves, such as light, from a surface.

As there is an inverse correlation between light absorption and reflection, PV modules are designed to absorb as much of the solar spectrum as possible to maximize efficiency. Virtually all PV modules installed in recent years have at least one anti-reflective coating to minimize reflection and maximize absorption. However, the front-facing surfaces of PV modules are smooth, specular surfaces that have the potential to reflect incoming solar radiation at high incidence angles, much like windows on a building or the surface of a pond or lake at sunrise or sunset (Parretta et al., 1999).

Under clear sky conditions, fixed-tilt PV arrays can produce glare in the early morning and evening when the sun is low on the horizon and the incidence angle between the PV modules and the sun is approximately 60 degrees or greater (Riley and Olsen, 2011). Unlike fixed-tilt systems, single-axis tracking PV arrays maintain relatively low incidence angles as they rotate to track the sun through the course of the day and thereby minimize the potential for glare. Incidence angle is the angle between the direct component of insolation (i.e., the sun) and a ray perpendicular to the PV module (angle b_2 in Figure 4). The incidence angle is equal to the reflectance angle.

Figure 3. Trigonometric Depiction of Glare from a PV Module



Trigonometric depiction of a receptor, a PV module, and the sun. Reflectance Angle = b_1; Incidence Angle = b_2. The distance between the sun and the earth (sides A and B; approximately 91 million miles) is great enough, relative to side C (less than 1,500 feet or 0.28 miles), that angle c is effectively 0°.

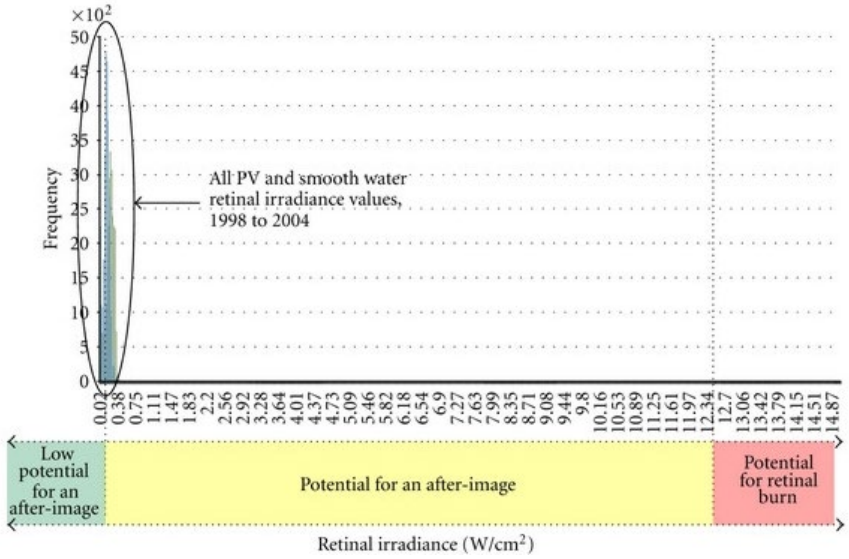
The potential effects of glare include annoyance impacts, such as distraction, after-image in the receptor's vision,[1] or temporary avoidance of a view due to the presence of reflected light (Dwyer, 2017; Slana, 2018); safety impacts, such as the potential to disorient motorists or pilots (Auffray et al., 2008; Ho et al., 2011; Riley and Olson, 2011); and human health impacts, such as permanent retinal damage (Ho et al., 2009). The effects of glare are dependent on the magnitude of glare that is produced. Glare that may be produced by a flat-plate PV array can be separated into two categories based on the potential cause a temporary after-image for a receptor. "Yellow glare" has a low potential to produce an after-image, while "green glare" is relatively low in intensity and is unlikely to produce an after-image. Yellow glare is similar in intensity to glare received from other sources regularly encountered by receptors (e.g., the rising or setting sun and the reflection of the sun off water features, windows, curtain wall buildings, and other smooth surfaces) and has a higher potential to produce and after-image.

"Red glare," which is glare that has the potential to cause eye damage, is typically not possible for non-concentrating (i.e., flat-plate) solar energy facilities such as the proposed Facility. Red glare and the resulting potential human health impacts are typically only associated with concentrating solar power plants or other convex reflective surfaces (e.g., convex curtain wall buildings) that concentrate the incoming solar radiation. Flat-plate PV systems, such as the proposed Facility, are incapable of producing the retinal irradiance levels necessary to result in retinal damage. Figure 3 provides a linear distribution of retinal irradiance showing

[1] After-image is when an image continues to appear in the eyes of the receptor after the exposure to glare has occurred.

PV modules and still water. PV modules generally have a retinal irradiance of 0.23-0.45 watts/centimeter^2 (W/cm^2), with smooth still water being similar at 0.13-0.38 W/cm^2 and on the bottom end of the retinal irradiance scale for having potential for an after-image (Riley and Olson, 2011). In comparison, staring directly at the sun has a retinal irradiance of 8 W/cm^2 (Ho et al., 2011).

Figure 4. Distribution of Retinal Irradiance



Graphic of linear distribution of retinal irradiance from Riley and Olson, 2011.

Other safety-related impacts of glare include the potential to distract or disorient drivers. For road users, glare from the sun is a common and well-studied phenomena (e.g., Auffray et al., 2008; Redweik, 2019). As evidence of this, all vehicles sold in the United States come with standard features such as sun visors and shade bands intended to help a road user cope with glare received from the sun or other sources. In consideration of these factors and the use of single-axis tracking PV arrays, road users travelling through the Facility area will generally not be exposed to glare in a manner that would impede traffic movements or create safety hazards.

3.0 METHODS

In order to accurately determine the occurrence, duration, and intensity of glare produced by a PV system at a given observation point and time period, the following information is needed:

1. Location, orientation, and reflectance of the PV modules;
2. Location of the observation point;
3. Position of the sun; and
4. Direct Normal Irradiance.

With these inputs, the location and duration of glare can be predicted using computer modeling programs together with follow-up visibility and climatological analyses, as needed. ForgeSolar, an industry standard commercial software based on the Solar Glare Hazard Analysis Tool (SGHAT) that was developed by Sandia National Laboratories, was used to evaluate the potential for glare for this Facility. ForgeSolar was initially developed for use by the Federal Aviation Administration (FAA) in evaluating safety impacts to pilots while landing aircraft (Ho et al., 2015). The scope of SGHAT's analytical capabilities has expanded to include the potential for a PV system to produce glare for terrestrial receptors, such as residences and motorists.

ForgeSolar provides a quantified assessment of when and where glare may occur throughout the year from solar installations, as well as identifying the potential effects on the human eye when glare does occur. However, the outputs of the SGHAT model represent a conservative analysis since it is based on a completely clear sky and bare earth model (i.e., it does not take into account atmospheric conditions that scatter incoming solar radiation and terrestrial obstructions that visually block the receipt of glare by an observer). Accordingly, SGHAT outputs represent the worst-case scenario.

No consistent U.S. standards exist to guide the development of a study area for assessing solar glare. However, standards have been developed in other countries. In Germany and Switzerland, for instance, solar glare assessments must be conducted for all dwellings that are located within 100 meters of a solar energy generating facility (Zehndorfer Engineering, 2019). For this assessment, the potential for glare was studied at each receptor and public road segment within 2 miles that was determined by viewshed analysis to have potential visibility of the Facility.

In modeling the potential for glare to be received at a residence, the receptor can be assumed to be a relatively static point with known attributes. Conversely, road users travel in multiple directions at differing velocities. As such, road segments (i.e., travel routes) with potential views of the Facility are used to assess glare impacts for motorists. For this Facility, glare was analyzed for :

- A total of 47 receptors (residences) that were determined by viewshed analysis to have potential visibility of the Facility (listed in Appendix A); and
- Eight travel routes that have potential visibility of the Facility.

Airports were not evaluated because no airports are located within 2 miles of the PV arrays.[2] The nearest airport is approximately 10.4 miles northwest (Cynthiana-Harrison County Airport) and the nearest heliport is approximately 2 miles northeast (Nicholas County Hospital). Given the distance to these facilities, no glare impacts are anticipated. Receptors and travel routes evaluated in this analysis are labeled and shown in Figure 5. Input variables and assumptions used for solar glare modeling calculations for the proposed Facility are described in Table 1 and in detail in Appendix B.

[2]Although a 2-mile study area is used in many assessments of glare impacts to airports, the FAA has no recommendations for study areas. A 2-mile radius was selected in this case as ForgeSolar uses a 2-mile approach/departure distance (i.e., the selected study area is large enough to include not only adjacent airports, but potential approach/departure routes that intersect the Facility site as well).

Figure 4. Receptors and Travel Routes

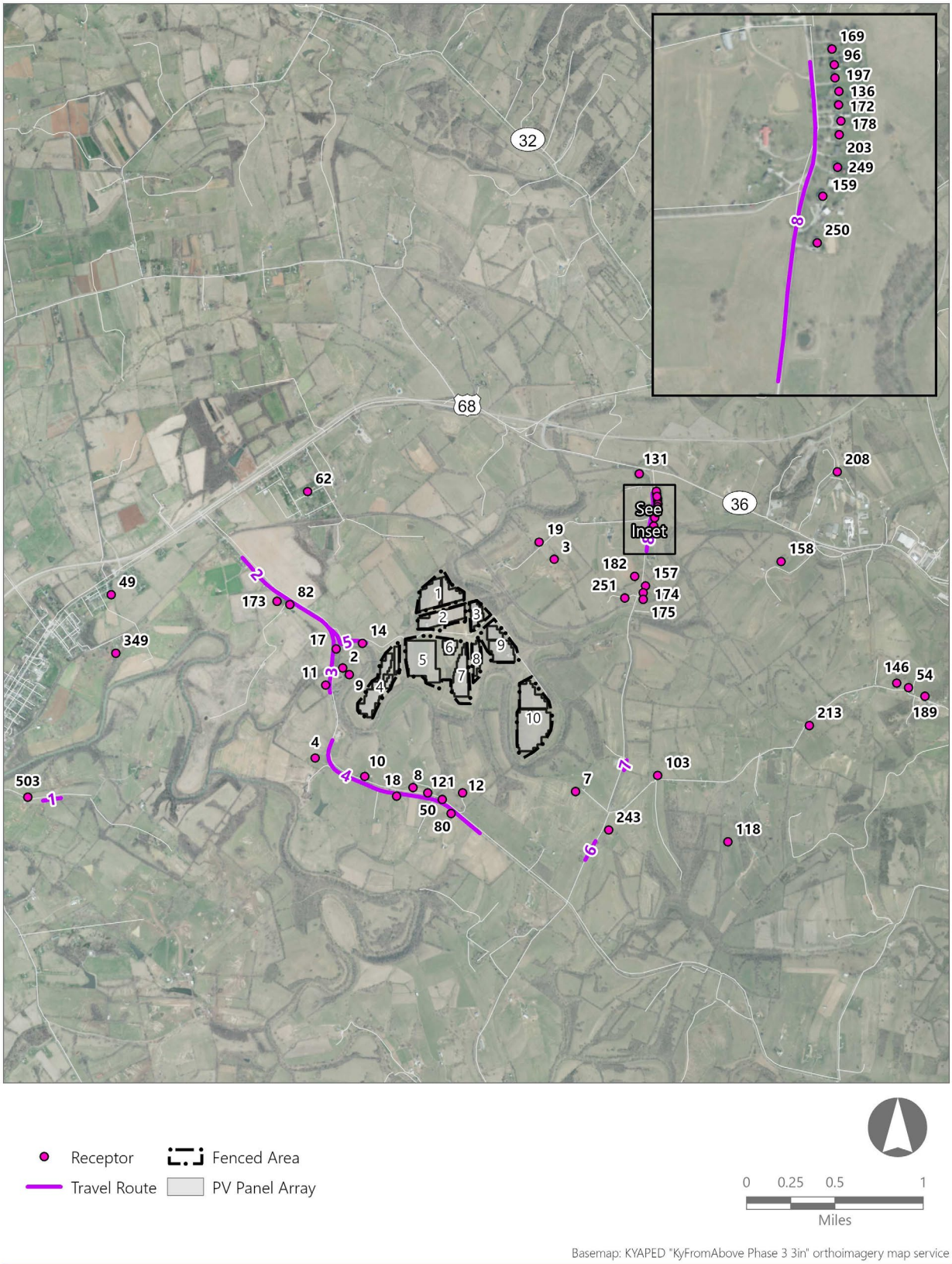


Table 1. Summary of SGHAT Model Inputs

Parameter		Purpose	Value
DNI:		The maximum DNI at the given location at solar noon. This variable is given in watts (W)/m^2. The peak DNI at solar noon is approximately 1,000 W/m^2 on a clear, sunny day.	Variable, based on sun position
Receptor height:		Height above ground of the average human eye viewing level.	5.4 feet
Array height:		Height above ground for the highest height and average height of the PV modules.	10 feet (maximum)
Axis tracking:		Indicates the type of tracking used by the PV modules (if any).	Single-axis tracking
Backtracking method		Rotate the modules away from the sun to reduce shading	Shade-Slope
Ground Cover Ratio (GCR)		Ratio between the PV module area and total ground area	45%
Fixed-Tilt	Orientation of array:	Orientation of the array in degrees, measured clockwise from true north.	N/A (tracking arrays used)
	Tilt of PV modules:	Tilt (elevation angle) of the modules in degrees, where 0° is facing up and 90° is facing horizontally.	N/A (tracking arrays used)
Single-Axis Tracking	Tilt of tracking axis:	The elevation angle of the tracking axis in degrees, where 0° is facing up and 90° is facing horizontally. The PV modules rotate about the tracking axis.	NA
	Orientation of tracking axis:	The orientation of the tracking axis in degrees, measured clockwise from true north. PV modules facing south at solar noon would have an orientation of 180°. PV modules facing east at solar noon would have an orientation of 90°.	180°
	Offset angle of PV module:	The vertical offset angle between the tracking axis and the PV module (if any).	0°
	Maximum tracking angle:	The maximum angle the PV module will rotate in both the clockwise and counterclockwise directions.	60°
	Resting angle:	The angle at which the PV module will backtrack to before resting overnight.	5°
PV module surface material:		The primary type of material on the surface of the PV modules.	Smooth glass w/ anti-reflection coating

4.0 RESULTS

Results from the glare analysis determined that no glare is modeled to be received at any of the identified residences or travel routes. Given that glare is not predicted at any of the identified residences and travel routes, which represent the nearest receptors with potential visibility of the Facility, glare is also not expected to occur at receptors or roadways at a greater distance. As the Applicant is currently proposing single-axis tracking PV arrays for the Facility, this result is not unexpected. As discussed in Section 2.0, single-axis tracking PV arrays maintain low incidence angles relative to the sun, significantly limiting the amount of incoming solar radiation that can be reflected by the arrays in the morning and evening when the receipt of solar glare by nearby receptors is most likely. Attachment B provides a detailed breakdown of the results for each receptor evaluated.

5.0 CONCLUSIONS

On behalf of the Applicant, EDR conducted a baseline solar glare analysis using ForgeSolar's SGHAT model to identify potential glare impacts from operation of the Facility. This analysis was conducted using industry standard methods and model inputs. The results of this analysis indicate that none of the potentially sensitive receptors located within 2 miles of the South Fork Solar Project will receive glare from the Facility.

This result is consistent with the proposed use of tracking PV arrays for the Facility. As noted previously, tracking PV arrays maintain low incidence angles by following the sun's position throughout the day. This increases the amount of incoming solar radiation absorbed by the PV modules and limits the amount reflected. For this reason, tracking PV arrays rarely reflect enough sunlight to produce retinal irradiance values (W/m^2) sufficient to result in either green or yellow glare.

Because the Facility is not anticipated to result in any glare impacts to identified receptors, no impact avoidance or mitigation measures are necessary.

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Appendix A

List of Receptors Assessed in SGHAT Model

Receptor ID	Receptor Type	Street Address	City	Latitude	Longitude	Elevation (feet)
54	Residential	750 PLEASANT SPRINGS RD	CARLISLE	38.3033	-84.0533	963
189	Residential	722 PLEASANT SPRINGS RD	CARLISLE	38.3026	-84.0516	960
213	Residential	1271 PLEASANT SPRINGS RD	CARLISLE	38.3002	-84.0636	953
146	Residential	780 PLEASANT SPRINGS RD	CARLISLE	38.3037	-84.0545	950
118	Residential	1833 PLEASANT SPRINGS RD	CARLISLE	38.2907	-84.0721	949
243	Residential	3047 PLEASANT SPRINGS RD	CARLISLE	38.2917	-84.0845	942
103	Residential	2148 PLEASANT SPRINGS RD	CARLISLE	38.2961	-84.0794	942
62	Residential	303 MARY LN	CARLISLE	38.3195	-84.1158	930
131	Residential	174 MILLER STATION RD	CARLISLE	38.3209	-84.0813	929
208	Commercial	1425 CONCRETE RD	CARLISLE	38.3210	-84.0606	922
197	Residential	305 MILLER STATION RD	CARLISLE	38.3190	-84.0794	915
169	Residential	245 MILLER STATION RD	CARLISLE	38.3195	-84.0795	914
96	Residential	295 MILLER STATION RD	CARLISLE	38.3192	-84.0795	913
80	Residential	2191 CARPENTER RD	CARLISLE	38.2931	-84.1009	909
158	Residential	302 PARIS LN	CARLISLE	38.3137	-84.0665	908
172	Residential	391 MILLER STATION RD	CARLISLE	38.3186	-84.0794	908
136	Residential	353 MILLER STATION RD	CARLISLE	38.3188	-84.0794	907
7	Residential	2897 PLEASANT SPRINGS RD	CARLISLE	38.2948	-84.0880	906
18	Residential	2453 CARPENTER RD	CARLISLE	38.2945	-84.1066	906
10	Residential	2512 CARPENTER RD	CARLISLE	38.2961	-84.1099	904
3	Residential	501 MILLER LN	CARLISLE	38.3139	-84.0902	903
178	Residential	403 MILLER STATION RD	CARLISLE	38.3184	-84.0793	902
203	Residential	459 MILLER STATION RD	CARLISLE	38.3182	-84.0794	902
4	Residential	2903 CARPENTER RD	CARLISLE	38.2976	-84.1151	901
50	Residential	2222 CARPENTER RD	CARLISLE	38.2942	-84.1018	899
19	Residential	500 MILLER LN	CARLISLE	38.3153	-84.0917	897
249	Residential	497 MILLER STATION RD	CARLISLE	38.3177	-84.0794	897
250	Residential	551 MILLER STATION RD	CARLISLE	38.3166	-84.0798	895
503	Residential	138 VIMONT LN	Millersburg	38.2944	-84.1450	894
8	Residential	2550 CARPENTER RD	CARLISLE	38.2952	-84.1049	891
49	Residential	110 LOCUST AVE	CARLISLE	38.3110	-84.1363	889
121	Residential	2352 CARPENTER RD	CARLISLE	38.2947	-84.1034	887
159	Residential	525 MILLER STATION RD	CARLISLE	38.3173	-84.0797	883
12	Residential	2202 CARPENTER RD	CARLISLE	38.2948	-84.0997	879
173	Residential	3881 CARPENTER RD	CARLISLE	38.3105	-84.1190	876
349	Residential	220 LEER ST	Millersburg	38.3062	-84.1358	868
251	Residential	786 MILLER LN	CARLISLE	38.3107	-84.0828	864
82	Residential	3851 CARPENTER RD	CARLISLE	38.3102	-84.1177	861

Receptor ID	Receptor Type	Street Address	City	Latitude	Longitude	Elevation (feet)
182	Residential	701 MILLER STATION RD	CARLISLE	38.3125	-84.0818	857
157	Residential	715 MILLER STATION RD	CARLISLE	38.3117	-84.0806	856
174	Residential	713 MILLER STATION RD	CARLISLE	38.3111	-84.0809	851
9	Residential	3450 CARPENTER RD	CARLISLE	38.3045	-84.1115	843
175	Residential	735 MILLER STATION RD	CARLISLE	38.3106	-84.0809	840
2	Residential	3452 CARPENTER RD	CARLISLE	38.3050	-84.1122	812
11	Residential	3449 CARPENTER RD	CARLISLE	38.3036	-84.1140	806
14	Residential	3722 CARPENTER RD	CARLISLE	38.3070	-84.1101	800
17	Residential	3552 CARPENTER RD	CARLISLE	38.3066	-84.1129	795

Appendix B

ForgeSolar Glare Analysis Results

FORGESOLAR GLARE ANALYSIS

Project: **South Fork Solar**
Site configuration: **Glare Analysis**
Calculated via ForgeSolar Radiometric Physics Engine v3.2.1

Created 18 Sep, 2026
Updated 18 Sep, 2026
Time-step 1 minute
Timezone offset UTC-5
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 500 kW to 1 MW
Site ID 188185.30954

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad

Sun dominance mitigation Enabled (max angle 10°)
Min luminance threshold 5,000 cd/m^2



Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
1	SA tracking	SA tracking	0	0.0	0	0.0	-
10	SA tracking	SA tracking	0	0.0	0	0.0	-
2	SA tracking	SA tracking	0	0.0	0	0.0	-
3	SA tracking	SA tracking	0	0.0	0	0.0	-
4	SA tracking	SA tracking	0	0.0	0	0.0	-
5	SA tracking	SA tracking	0	0.0	0	0.0	-
6	SA tracking	SA tracking	0	0.0	0	0.0	-
7	SA tracking	SA tracking	0	0.0	0	0.0	-
8	SA tracking	SA tracking	0	0.0	0	0.0	-
9	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

Component Data

PV Arrays

Name: 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.311861	-84.100856	876.16	10.00	886.16
2	38.311519	-84.100124	872.67	10.00	882.67
3	38.311222	-84.099524	874.34	10.00	884.34
4	38.310574	-84.099527	862.46	10.00	872.46
5	38.310046	-84.102048	858.12	10.00	868.12
6	38.309571	-84.104317	851.67	10.00	861.67
7	38.310763	-84.104297	842.25	10.00	852.25
8	38.311428	-84.104166	844.86	10.00	854.86
9	38.312263	-84.102896	866.65	10.00	876.65
10	38.312572	-84.101383	884.20	10.00	894.20

Name: 10
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.301959	-84.090515	821.54	10.00	831.54
2	38.299302	-84.090489	781.98	10.00	791.98
3	38.298111	-84.092327	798.20	10.00	808.20
4	38.298107	-84.094090	781.48	10.00	791.48
5	38.301344	-84.094106	789.12	10.00	799.12
6	38.303691	-84.093897	786.95	10.00	796.95
7	38.304008	-84.093148	819.41	10.00	829.41
8	38.304018	-84.092315	839.91	10.00	849.91

Name: 2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.309057	-84.099377	874.14	10.00	884.14
2	38.308778	-84.100637	867.41	10.00	877.41
3	38.308513	-84.101828	838.74	10.00	848.74
4	38.308180	-84.103327	856.67	10.00	866.67
5	38.308182	-84.104392	848.77	10.00	858.77
6	38.309199	-84.104390	852.23	10.00	862.23
7	38.309589	-84.102604	860.77	10.00	870.77
8	38.309925	-84.101065	875.14	10.00	885.14
9	38.310290	-84.099393	858.18	10.00	868.18

Name: 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.309948	-84.097454	857.87	10.00	867.87
2	38.308882	-84.097439	843.41	10.00	853.41
3	38.308089	-84.098461	852.08	10.00	862.08
4	38.308008	-84.098850	860.09	10.00	870.09
5	38.309185	-84.098935	861.57	10.00	871.57
6	38.310367	-84.099021	859.56	10.00	869.56
7	38.310535	-84.098219	861.83	10.00	871.83

Name: 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.304699	-84.106281	799.35	10.00	809.35
2	38.303296	-84.107202	826.65	10.00	836.65
3	38.302151	-84.108369	820.61	10.00	830.61
4	38.300915	-84.109078	789.81	10.00	799.81
5	38.300920	-84.110137	784.04	10.00	794.04
6	38.301507	-84.110668	793.14	10.00	803.14
7	38.302116	-84.110667	790.75	10.00	800.75
8	38.303267	-84.109713	789.99	10.00	799.99
9	38.303941	-84.109152	792.31	10.00	802.31
10	38.304215	-84.108587	815.44	10.00	825.44
11	38.305927	-84.108141	839.12	10.00	849.12
12	38.306799	-84.107025	837.72	10.00	847.72
13	38.306796	-84.106277	812.82	10.00	822.82
14	38.305622	-84.106279	814.89	10.00	824.89

Name: 5
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.304993	-84.102005	822.07	10.00	832.07
2	38.303750	-84.101940	804.52	10.00	814.52
3	38.303751	-84.103546	797.76	10.00	807.76
4	38.304307	-84.103650	823.87	10.00	833.87
5	38.304304	-84.105562	782.46	10.00	792.46
6	38.304950	-84.105587	786.86	10.00	796.86
7	38.306108	-84.105632	797.30	10.00	807.30
8	38.307370	-84.105681	806.78	10.00	816.78
9	38.307366	-84.102413	829.41	10.00	839.41
10	38.306096	-84.102415	826.20	10.00	836.20
11	38.304998	-84.102418	834.38	10.00	844.38

Name: 6
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.307279	-84.100237	852.27	10.00	862.27
2	38.306652	-84.100250	836.90	10.00	846.90
3	38.306074	-84.100489	825.65	10.00	835.65
4	38.306073	-84.101863	802.96	10.00	812.96
5	38.307287	-84.101880	828.19	10.00	838.19

Name: 7
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.303742	-84.099001	827.26	10.00	837.26
2	38.302591	-84.098917	815.42	10.00	825.42
3	38.302595	-84.100608	789.17	10.00	799.17
4	38.303189	-84.100952	788.69	10.00	798.69
5	38.303772	-84.100951	789.25	10.00	799.25
6	38.304965	-84.100576	803.92	10.00	813.92
7	38.306104	-84.100134	820.68	10.00	830.68
8	38.306996	-84.099719	841.92	10.00	851.92
9	38.306992	-84.099236	847.12	10.00	857.12
10	38.306080	-84.099170	842.05	10.00	852.05
11	38.304940	-84.099087	840.06	10.00	850.06

Name: 8
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.307283	-84.098019	836.47	10.00	846.47
2	38.306077	-84.097741	833.25	10.00	843.25
3	38.305222	-84.097743	825.69	10.00	835.69
4	38.304284	-84.097965	818.60	10.00	828.60
5	38.304296	-84.098639	835.71	10.00	845.71
6	38.305222	-84.098686	843.52	10.00	853.52
7	38.306102	-84.098750	847.28	10.00	857.28
8	38.306973	-84.098748	850.33	10.00	860.33
9	38.307288	-84.098401	845.24	10.00	855.24

Name: 9
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 180.0°
Max tracking angle: 60.0°
Resting angle: 5.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating (revised)



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.306679	-84.094130	842.56	10.00	852.56
2	38.305444	-84.094098	847.16	10.00	857.16
3	38.305445	-84.095372	838.58	10.00	848.58
4	38.305446	-84.096744	797.98	10.00	807.98
5	38.306077	-84.096742	800.37	10.00	810.37
6	38.306344	-84.097117	807.34	10.00	817.34
7	38.307307	-84.097241	818.54	10.00	828.54
8	38.308489	-84.097213	842.44	10.00	852.44
9	38.308486	-84.095893	840.08	10.00	850.08
10	38.307628	-84.095055	846.82	10.00	856.82

Route Receptors

Name: Route 1
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.294157	-84.143445	873.20	5.40	878.60
2	38.294227	-84.142880	879.47	5.40	884.87
3	38.294287	-84.142314	880.17	5.40	885.57
4	38.294381	-84.141549	864.75	5.40	870.15

Name: Route 2
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.314078	-84.122624	891.38	5.40	896.78
2	38.313124	-84.121574	891.36	5.40	896.76
3	38.312361	-84.120737	881.71	5.40	887.11
4	38.311904	-84.120144	874.97	5.40	880.37
5	38.311360	-84.119308	865.97	5.40	871.37
6	38.310556	-84.117730	854.83	5.40	860.23
7	38.309935	-84.116503	852.48	5.40	857.88
8	38.309363	-84.115356	844.58	5.40	849.98
9	38.308889	-84.114367	828.74	5.40	834.14
10	38.308541	-84.113900	818.59	5.40	823.99
11	38.308286	-84.113634	812.25	5.40	817.65

Name: Route 3
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.308286	-84.113634	812.25	5.40	817.65
2	38.308076	-84.113453	807.88	5.40	813.28
3	38.307715	-84.113278	799.85	5.40	805.25
4	38.307250	-84.113137	790.51	5.40	795.91
5	38.306755	-84.113131	783.14	5.40	788.54
6	38.306053	-84.113237	777.63	5.40	783.03
7	38.305465	-84.113305	778.29	5.40	783.69
8	38.304938	-84.113367	759.01	5.40	764.41
9	38.304451	-84.113465	781.51	5.40	786.91
10	38.303821	-84.113552	790.58	5.40	795.98
11	38.303292	-84.113571	802.91	5.40	808.31
12	38.302973	-84.113513	809.64	5.40	815.04

Name: Route 4
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.299092	-84.113276	866.14	5.40	871.54
2	38.298746	-84.113461	867.59	5.40	872.99
3	38.298302	-84.113669	867.49	5.40	872.89
4	38.297859	-84.113731	864.71	5.40	870.11
5	38.297466	-84.113647	862.95	5.40	868.35
6	38.297096	-84.113446	865.26	5.40	870.66
7	38.296740	-84.113123	870.97	5.40	876.37
8	38.296501	-84.112750	875.12	5.40	880.52
9	38.296326	-84.112390	877.88	5.40	883.28
10	38.296054	-84.111607	879.01	5.40	884.41
11	38.295786	-84.110839	876.83	5.40	882.23
12	38.295443	-84.109794	873.41	5.40	878.81
13	38.295082	-84.108750	876.84	5.40	882.24
14	38.294953	-84.108280	882.35	5.40	887.75
15	38.294822	-84.107607	889.47	5.40	894.87
16	38.294745	-84.107007	892.81	5.40	898.21
17	38.294669	-84.106129	892.46	5.40	897.86
18	38.294450	-84.104356	876.09	5.40	881.49
19	38.294262	-84.103062	873.87	5.40	879.27
20	38.294170	-84.102622	876.60	5.40	882.00
21	38.294038	-84.102210	878.91	5.40	884.31
22	38.293689	-84.101398	884.20	5.40	889.60
23	38.293256	-84.100675	889.48	5.40	894.88
24	38.292826	-84.100038	896.60	5.40	902.00
25	38.292244	-84.099162	908.56	5.40	913.96
26	38.291429	-84.097935	911.52	5.40	916.92

Name: Route 5
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.308279	-84.113615	812.22	5.40	817.62
2	38.308038	-84.113217	807.93	5.40	813.33
3	38.307708	-84.112823	801.93	5.40	807.33
4	38.307608	-84.112731	799.78	5.40	805.18
5	38.307315	-84.112582	790.23	5.40	795.63
6	38.307060	-84.112472	779.33	5.40	784.73
7	38.306975	-84.112311	775.05	5.40	780.45
8	38.306984	-84.112049	774.88	5.40	780.28
9	38.307209	-84.111575	770.45	5.40	775.85
10	38.307229	-84.111226	768.98	5.40	774.38
11	38.307224	-84.110507	781.40	5.40	786.80
12	38.307171	-84.110132	795.39	5.40	800.79
13	38.307043	-84.109731	808.70	5.40	814.10

Name: Route 6
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.289223	-84.086979	899.07	5.40	904.47
2	38.289673	-84.086654	898.74	5.40	904.14
3	38.290176	-84.086321	905.40	5.40	910.80
4	38.290784	-84.085894	906.86	5.40	912.26

Name: Route 7
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.296587	-84.082920	907.77	5.40	913.17
2	38.296865	-84.082803	917.87	5.40	923.27
3	38.297093	-84.082711	924.96	5.40	930.36
4	38.297393	-84.082631	923.44	5.40	928.84

Name: Route 8
Path type: Two-way
Azimuthal view angle: 50.0°
Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	38.314537	-84.080529	856.37	5.40	861.77
2	38.315205	-84.080421	871.59	5.40	876.99
3	38.315882	-84.080345	878.98	5.40	884.38
4	38.316609	-84.080230	872.41	5.40	877.81
5	38.317115	-84.080114	872.70	5.40	878.10
6	38.317402	-84.080019	874.65	5.40	880.05
7	38.317775	-84.079863	879.27	5.40	884.67
8	38.317958	-84.079830	881.48	5.40	886.88
9	38.318304	-84.079816	885.28	5.40	890.68
10	38.318714	-84.079845	889.17	5.40	894.57
11	38.319285	-84.079916	891.62	5.40	897.02

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (ft)	Height (ft)
OP 2	2	38.305020	-84.112197	812.47	5.40
OP 3	3	38.313907	-84.090164	902.52	5.40
OP 4	4	38.297620	-84.115085	901.09	5.40
OP 7	7	38.294841	-84.087960	906.28	5.40
OP 8	8	38.295178	-84.104904	891.21	5.40
OP 9	9	38.304471	-84.111522	843.49	5.40
OP 10	10	38.296109	-84.109928	904.39	5.40
OP 11	11	38.303609	-84.113968	806.48	5.40
OP 12	12	38.294762	-84.099749	878.91	5.40
OP 14	14	38.307030	-84.110145	799.87	5.40
OP 17	17	38.306576	-84.112891	795.10	5.40
OP 18	18	38.294500	-84.106610	905.68	5.40
OP 19	19	38.315309	-84.091722	896.94	5.40
OP 49	49	38.311036	-84.136294	888.62	5.40
OP 50	50	38.294220	-84.101849	898.84	5.40
OP 54	54	38.303320	-84.053255	962.53	5.40
OP 62	62	38.319499	-84.115829	929.89	5.40
OP 80	80	38.293055	-84.100934	908.57	5.40
OP 82	82	38.310205	-84.117692	860.82	5.40
OP 96	96	38.319240	-84.079457	913.30	5.40
OP 103	103	38.296145	-84.079423	941.61	5.40
OP 118	118	38.290700	-84.072110	949.49	5.40
OP 121	121	38.294745	-84.103373	887.33	5.40
OP 131	131	38.320892	-84.081286	929.07	5.40
OP 136	136	38.318846	-84.079369	907.21	5.40
OP 146	146	38.303679	-84.054516	949.79	5.40
OP 157	157	38.311710	-84.080640	855.66	5.40
OP 158	158	38.313688	-84.066499	908.11	5.40
OP 159	159	38.317290	-84.079676	883.17	5.40
OP 169	169	38.319474	-84.079501	913.79	5.40
OP 172	172	38.318645	-84.079374	907.59	5.40
OP 173	173	38.310489	-84.119016	875.99	5.40
OP 174	174	38.311129	-84.080875	850.74	5.40
OP 175	175	38.310590	-84.080886	840.48	5.40
OP 178	178	38.318408	-84.079335	902.26	5.40
OP 182	182	38.312487	-84.081764	856.54	5.40
OP 189	189	38.302609	-84.051570	960.39	5.40
OP 197	197	38.319045	-84.079443	914.81	5.40
OP 203	203	38.318201	-84.079363	901.87	5.40
OP 208	208	38.321018	-84.060646	922.40	5.40
OP 213	213	38.300221	-84.063593	952.95	5.40
OP 243	243	38.291685	-84.084538	942.41	5.40
OP 249	249	38.317719	-84.079396	896.79	5.40
OP 250	250	38.316597	-84.079787	895.24	5.40
OP 251	251	38.310712	-84.082814	863.54	5.40
OP 349	349	38.306242	-84.135826	868.26	5.40
OP 503	503	38.294449	-84.145002	894.13	5.40

Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
1	SA tracking	SA tracking	0	0.0	0	0.0	-
10	SA tracking	SA tracking	0	0.0	0	0.0	-
2	SA tracking	SA tracking	0	0.0	0	0.0	-
3	SA tracking	SA tracking	0	0.0	0	0.0	-
4	SA tracking	SA tracking	0	0.0	0	0.0	-
5	SA tracking	SA tracking	0	0.0	0	0.0	-
6	SA tracking	SA tracking	0	0.0	0	0.0	-
7	SA tracking	SA tracking	0	0.0	0	0.0	-
8	SA tracking	SA tracking	0	0.0	0	0.0	-
9	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

PV: 1 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

1 and Route: Route 1

No glare found

1 and Route: Route 2

No glare found

1 and Route: Route 3

No glare found

1 and Route: Route 4

No glare found

1 and Route: Route 5

No glare found

1 and Route: Route 6

No glare found

1 and Route: Route 7

No glare found

1 and Route: Route 8

No glare found

1 and OP 2

No glare found

1 and OP 3

No glare found

1 and OP 4

No glare found

1 and OP 7

No glare found

1 and OP 8

No glare found

1 and OP 9

No glare found

1 and OP 10

No glare found

1 and OP 11

No glare found

1 and OP 12

No glare found

1 and OP 14

No glare found

1 and OP 17

No glare found

1 and OP 18

No glare found

1 and OP 19

No glare found

1 and OP 49

No glare found

1 and OP 50

No glare found

1 and OP 54

No glare found

1 and OP 62

No glare found

1 and OP 80

No glare found

1 and OP 82

No glare found

1 and OP 96

No glare found

1 and OP 103

No glare found

1 and OP 118

No glare found

1 and OP 121

No glare found

1 and OP 131

No glare found

1 and OP 136

No glare found

1 and OP 146

No glare found

1 and OP 157

No glare found

1 and OP 158

No glare found

1 and OP 159

No glare found

1 and OP 169

No glare found

1 and OP 172

No glare found

1 and OP 173

No glare found

1 and OP 174

No glare found

1 and OP 175

No glare found

1 and OP 178

No glare found

1 and OP 182

No glare found

1 and OP 189

No glare found

1 and OP 197

No glare found

1 and OP 203

No glare found

1 and OP 208

No glare found

1 and OP 213

No glare found

1 and OP 243

No glare found

1 and OP 249

No glare found

1 and OP 250

No glare found

1 and OP 251

No glare found

1 and OP 349

No glare found

1 and OP 503

No glare found

PV: 10 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

10 and Route: Route 1

No glare found

10 and Route: Route 2

No glare found

10 and Route: Route 3

No glare found

10 and Route: Route 4

No glare found

10 and Route: Route 5

No glare found

10 and Route: Route 6

No glare found

10 and Route: Route 7

No glare found

10 and Route: Route 8

No glare found

10 and OP 2

No glare found

10 and OP 3

No glare found

10 and OP 4

No glare found

10 and OP 7

No glare found

10 and OP 8

No glare found

10 and OP 9

No glare found

10 and OP 10

No glare found

10 and OP 11

No glare found

10 and OP 12

No glare found

10 and OP 14

No glare found

10 and OP 17

No glare found

10 and OP 18

No glare found

10 and OP 19

No glare found

10 and OP 49

No glare found

10 and OP 50

No glare found

10 and OP 54

No glare found

10 and OP 62

No glare found

10 and OP 80

No glare found

10 and OP 82

No glare found

10 and OP 96

No glare found

10 and OP 103

No glare found

10 and OP 118

No glare found

10 and OP 121

No glare found

10 and OP 131

No glare found

10 and OP 136

No glare found

10 and OP 146

No glare found

10 and OP 157

No glare found

10 and OP 158

No glare found

10 and OP 159

No glare found

10 and OP 169

No glare found

10 and OP 172

No glare found

10 and OP 173

No glare found

10 and OP 174

No glare found

10 and OP 175

No glare found

10 and OP 178

No glare found

10 and OP 182

No glare found

10 and OP 189

No glare found

10 and OP 197

No glare found

10 and OP 203

No glare found

10 and OP 208

No glare found

10 and OP 213

No glare found

10 and OP 243

No glare found

10 and OP 249

No glare found

10 and OP 250

No glare found

10 and OP 251

No glare found

10 and OP 349

No glare found

10 and OP 503

No glare found

PV: 2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

2 and Route: Route 1

No glare found

2 and Route: Route 2

No glare found

2 and Route: Route 3

No glare found

2 and Route: Route 4

No glare found

2 and Route: Route 5

No glare found

2 and Route: Route 6

No glare found

2 and Route: Route 7

No glare found

2 and Route: Route 8

No glare found

2 and OP 2

No glare found

2 and OP 3

No glare found

2 and OP 4

No glare found

2 and OP 7

No glare found

2 and OP 8

No glare found

2 and OP 9

No glare found

2 and OP 10

No glare found

2 and OP 11

No glare found

2 and OP 12

No glare found

2 and OP 14

No glare found

2 and OP 17

No glare found

2 and OP 18

No glare found

2 and OP 19

No glare found

2 and OP 49

No glare found

2 and OP 50

No glare found

2 and OP 54

No glare found

2 and OP 62

No glare found

2 and OP 80

No glare found

2 and OP 82

No glare found

2 and OP 96

No glare found

2 and OP 103

No glare found

2 and OP 118

No glare found

2 and OP 121

No glare found

2 and OP 131

No glare found

2 and OP 136

No glare found

2 and OP 146

No glare found

2 and OP 157

No glare found

2 and OP 158

No glare found

2 and OP 159

No glare found

2 and OP 169

No glare found

2 and OP 172

No glare found

2 and OP 173

No glare found

2 and OP 174

No glare found

2 and OP 175

No glare found

2 and OP 178

No glare found

2 and OP 182

No glare found

2 and OP 189

No glare found

2 and OP 197

No glare found

2 and OP 203

No glare found

2 and OP 208

No glare found

2 and OP 213

No glare found

2 and OP 243

No glare found

2 and OP 249

No glare found

2 and OP 250

No glare found

2 and OP 251

No glare found

2 and OP 349

No glare found

2 and OP 503

No glare found

PV: 3 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

3 and Route: Route 1

No glare found

3 and Route: Route 2

No glare found

3 and Route: Route 3

No glare found

3 and Route: Route 4

No glare found

3 and Route: Route 5

No glare found

3 and Route: Route 6

No glare found

3 and Route: Route 7

No glare found

3 and Route: Route 8

No glare found

3 and OP 2

No glare found

3 and OP 3

No glare found

3 and OP 4

No glare found

3 and OP 7

No glare found

3 and OP 8

No glare found

3 and OP 9

No glare found

3 and OP 10

No glare found

3 and OP 11

No glare found

3 and OP 12

No glare found

3 and OP 14

No glare found

3 and OP 17

No glare found

3 and OP 18

No glare found

3 and OP 19

No glare found

3 and OP 49

No glare found

3 and OP 50

No glare found

3 and OP 54

No glare found

3 and OP 62

No glare found

3 and OP 80

No glare found

3 and OP 82

No glare found

3 and OP 96

No glare found

3 and OP 103

No glare found

3 and OP 118

No glare found

3 and OP 121

No glare found

3 and OP 131

No glare found

3 and OP 136

No glare found

3 and OP 146

No glare found

3 and OP 157

No glare found

3 and OP 158

No glare found

3 and OP 159

No glare found

3 and OP 169

No glare found

3 and OP 172

No glare found

3 and OP 173

No glare found

3 and OP 174

No glare found

3 and OP 175

No glare found

3 and OP 178

No glare found

3 and OP 182

No glare found

3 and OP 189

No glare found

3 and OP 197

No glare found

3 and OP 203

No glare found

3 and OP 208

No glare found

3 and OP 213

No glare found

3 and OP 243

No glare found

3 and OP 249

No glare found

3 and OP 250

No glare found

3 and OP 251

No glare found

3 and OP 349

No glare found

3 and OP 503

No glare found

PV: 4 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

4 and Route: Route 1

No glare found

4 and Route: Route 2

No glare found

4 and Route: Route 3

No glare found

4 and Route: Route 4

No glare found

4 and Route: Route 5

No glare found

4 and Route: Route 6

No glare found

4 and Route: Route 7

No glare found

4 and Route: Route 8

No glare found

4 and OP 2

No glare found

4 and OP 3

No glare found

4 and OP 4

No glare found

4 and OP 7

No glare found

4 and OP 8

No glare found

4 and OP 9

No glare found

4 and OP 10

No glare found

4 and OP 11

No glare found

4 and OP 12

No glare found

4 and OP 14

No glare found

4 and OP 17

No glare found

4 and OP 18

No glare found

4 and OP 19

No glare found

4 and OP 49

No glare found

4 and OP 50

No glare found

4 and OP 54

No glare found

4 and OP 62

No glare found

4 and OP 80

No glare found

4 and OP 82

No glare found

4 and OP 96

No glare found

4 and OP 103

No glare found

4 and OP 118

No glare found

4 and OP 121

No glare found

4 and OP 131

No glare found

4 and OP 136

No glare found

4 and OP 146

No glare found

4 and OP 157

No glare found

4 and OP 158

No glare found

4 and OP 159

No glare found

4 and OP 169

No glare found

4 and OP 172

No glare found

4 and OP 173

No glare found

4 and OP 174

No glare found

4 and OP 175

No glare found

4 and OP 178

No glare found

4 and OP 182

No glare found

4 and OP 189

No glare found

4 and OP 197

No glare found

4 and OP 203

No glare found

4 and OP 208

No glare found

4 and OP 213

No glare found

4 and OP 243

No glare found

4 and OP 249

No glare found

4 and OP 250

No glare found

4 and OP 251

No glare found

4 and OP 349

No glare found

4 and OP 503

No glare found

PV: 5 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

5 and Route: Route 1

No glare found

5 and Route: Route 2

No glare found

5 and Route: Route 3

No glare found

5 and Route: Route 4

No glare found

5 and Route: Route 5

No glare found

5 and Route: Route 6

No glare found

5 and Route: Route 7

No glare found

5 and Route: Route 8

No glare found

5 and OP 2

No glare found

5 and OP 3

No glare found

5 and OP 4

No glare found

5 and OP 7

No glare found

5 and OP 8

No glare found

5 and OP 9

No glare found

5 and OP 10

No glare found

5 and OP 11

No glare found

5 and OP 12

No glare found

5 and OP 14

No glare found

5 and OP 17

No glare found

5 and OP 18

No glare found

5 and OP 19

No glare found

5 and OP 49

No glare found

5 and OP 50

No glare found

5 and OP 54

No glare found

5 and OP 62

No glare found

5 and OP 80

No glare found

5 and OP 82

No glare found

5 and OP 96

No glare found

5 and OP 103

No glare found

5 and OP 118

No glare found

5 and OP 121

No glare found

5 and OP 131

No glare found

5 and OP 136

No glare found

5 and OP 146

No glare found

5 and OP 157

No glare found

5 and OP 158

No glare found

5 and OP 159

No glare found

5 and OP 169

No glare found

5 and OP 172

No glare found

5 and OP 173

No glare found

5 and OP 174

No glare found

5 and OP 175

No glare found

5 and OP 178

No glare found

5 and OP 182

No glare found

5 and OP 189

No glare found

5 and OP 197

No glare found

5 and OP 203

No glare found

5 and OP 208

No glare found

5 and OP 213

No glare found

5 and OP 243

No glare found

5 and OP 249

No glare found

5 and OP 250

No glare found

5 and OP 251

No glare found

5 and OP 349

No glare found

5 and OP 503

No glare found

PV: 6 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

6 and Route: Route 1

No glare found

6 and Route: Route 2

No glare found

6 and Route: Route 3

No glare found

6 and Route: Route 4

No glare found

6 and Route: Route 5

No glare found

6 and Route: Route 6

No glare found

6 and Route: Route 7

No glare found

6 and Route: Route 8

No glare found

6 and OP 2

No glare found

6 and OP 3

No glare found

6 and OP 4

No glare found

6 and OP 7

No glare found

6 and OP 8

No glare found

6 and OP 9

No glare found

6 and OP 10

No glare found

6 and OP 11

No glare found

6 and OP 12

No glare found

6 and OP 14

No glare found

6 and OP 17

No glare found

6 and OP 18

No glare found

6 and OP 19

No glare found

6 and OP 49

No glare found

6 and OP 50

No glare found

6 and OP 54

No glare found

6 and OP 62

No glare found

6 and OP 80

No glare found

6 and OP 82

No glare found

6 and OP 96

No glare found

6 and OP 103

No glare found

6 and OP 118

No glare found

6 and OP 121

No glare found

6 and OP 131

No glare found

6 and OP 136

No glare found

6 and OP 146

No glare found

6 and OP 157

No glare found

6 and OP 158

No glare found

6 and OP 159

No glare found

6 and OP 169

No glare found

6 and OP 172

No glare found

6 and OP 173

No glare found

6 and OP 174

No glare found

6 and OP 175

No glare found

6 and OP 178

No glare found

6 and OP 182

No glare found

6 and OP 189

No glare found

6 and OP 197

No glare found

6 and OP 203

No glare found

6 and OP 208

No glare found

6 and OP 213

No glare found

6 and OP 243

No glare found

6 and OP 249

No glare found

6 and OP 250

No glare found

6 and OP 251

No glare found

6 and OP 349

No glare found

6 and OP 503

No glare found

PV: 7 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

7 and Route: Route 1

No glare found

7 and Route: Route 2

No glare found

7 and Route: Route 3

No glare found

7 and Route: Route 4

No glare found

7 and Route: Route 5

No glare found

7 and Route: Route 6

No glare found

7 and Route: Route 7

No glare found

7 and Route: Route 8

No glare found

7 and OP 2

No glare found

7 and OP 3

No glare found

7 and OP 4

No glare found

7 and OP 7

No glare found

7 and OP 8

No glare found

7 and OP 9

No glare found

7 and OP 10

No glare found

7 and OP 11

No glare found

7 and OP 12

No glare found

7 and OP 14

No glare found

7 and OP 17

No glare found

7 and OP 18

No glare found

7 and OP 19

No glare found

7 and OP 49

No glare found

7 and OP 50

No glare found

7 and OP 54

No glare found

7 and OP 62

No glare found

7 and OP 80

No glare found

7 and OP 82

No glare found

7 and OP 96

No glare found

7 and OP 103

No glare found

7 and OP 118

No glare found

7 and OP 121

No glare found

7 and OP 131

No glare found

7 and OP 136

No glare found

7 and OP 146

No glare found

7 and OP 157

No glare found

7 and OP 158

No glare found

7 and OP 159

No glare found

7 and OP 169

No glare found

7 and OP 172

No glare found

7 and OP 173

No glare found

7 and OP 174

No glare found

7 and OP 175

No glare found

7 and OP 178

No glare found

7 and OP 182

No glare found

7 and OP 189

No glare found

7 and OP 197

No glare found

7 and OP 203

No glare found

7 and OP 208

No glare found

7 and OP 213

No glare found

7 and OP 243

No glare found

7 and OP 249

No glare found

7 and OP 250

No glare found

7 and OP 251

No glare found

7 and OP 349

No glare found

7 and OP 503

No glare found

PV: 8 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

8 and Route: Route 1

No glare found

8 and Route: Route 2

No glare found

8 and Route: Route 3

No glare found

8 and Route: Route 4

No glare found

8 and Route: Route 5

No glare found

8 and Route: Route 6

No glare found

8 and Route: Route 7

No glare found

8 and Route: Route 8

No glare found

8 and OP 2

No glare found

8 and OP 3

No glare found

8 and OP 4

No glare found

8 and OP 7

No glare found

8 and OP 8

No glare found

8 and OP 9

No glare found

8 and OP 10

No glare found

8 and OP 11

No glare found

8 and OP 12

No glare found

8 and OP 14

No glare found

8 and OP 17

No glare found

8 and OP 18

No glare found

8 and OP 19

No glare found

8 and OP 49

No glare found

8 and OP 50

No glare found

8 and OP 54

No glare found

8 and OP 62

No glare found

8 and OP 80

No glare found

8 and OP 82

No glare found

8 and OP 96

No glare found

8 and OP 103

No glare found

8 and OP 118

No glare found

8 and OP 121

No glare found

8 and OP 131

No glare found

8 and OP 136

No glare found

8 and OP 146

No glare found

8 and OP 157

No glare found

8 and OP 158

No glare found

8 and OP 159

No glare found

8 and OP 169

No glare found

8 and OP 172

No glare found

8 and OP 173

No glare found

8 and OP 174

No glare found

8 and OP 175

No glare found

8 and OP 178

No glare found

8 and OP 182

No glare found

8 and OP 189

No glare found

8 and OP 197

No glare found

8 and OP 203

No glare found

8 and OP 208

No glare found

8 and OP 213

No glare found

8 and OP 243

No glare found

8 and OP 249

No glare found

8 and OP 250

No glare found

8 and OP 251

No glare found

8 and OP 349

No glare found

8 and OP 503

No glare found

PV: 9 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route 1	0	0.0	0	0.0
Route 2	0	0.0	0	0.0
Route 3	0	0.0	0	0.0
Route 4	0	0.0	0	0.0
Route 5	0	0.0	0	0.0
Route 6	0	0.0	0	0.0
Route 7	0	0.0	0	0.0
Route 8	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 49	0	0.0	0	0.0
OP 50	0	0.0	0	0.0
OP 54	0	0.0	0	0.0
OP 62	0	0.0	0	0.0
OP 80	0	0.0	0	0.0
OP 82	0	0.0	0	0.0
OP 96	0	0.0	0	0.0
OP 103	0	0.0	0	0.0
OP 118	0	0.0	0	0.0
OP 121	0	0.0	0	0.0
OP 131	0	0.0	0	0.0
OP 136	0	0.0	0	0.0
OP 146	0	0.0	0	0.0
OP 157	0	0.0	0	0.0
OP 158	0	0.0	0	0.0
OP 159	0	0.0	0	0.0
OP 169	0	0.0	0	0.0
OP 172	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 173	0	0.0	0	0.0
OP 174	0	0.0	0	0.0
OP 175	0	0.0	0	0.0
OP 178	0	0.0	0	0.0
OP 182	0	0.0	0	0.0
OP 189	0	0.0	0	0.0
OP 197	0	0.0	0	0.0
OP 203	0	0.0	0	0.0
OP 208	0	0.0	0	0.0
OP 213	0	0.0	0	0.0
OP 243	0	0.0	0	0.0
OP 249	0	0.0	0	0.0
OP 250	0	0.0	0	0.0
OP 251	0	0.0	0	0.0
OP 349	0	0.0	0	0.0
OP 503	0	0.0	0	0.0

9 and Route: Route 1

No glare found

9 and Route: Route 2

No glare found

9 and Route: Route 3

No glare found

9 and Route: Route 4

No glare found

9 and Route: Route 5

No glare found

9 and Route: Route 6

No glare found

9 and Route: Route 7

No glare found

9 and Route: Route 8

No glare found

9 and OP 2

No glare found

9 and OP 3

No glare found

9 and OP 4

No glare found

9 and OP 7

No glare found

9 and OP 8

No glare found

9 and OP 9

No glare found

9 and OP 10

No glare found

9 and OP 11

No glare found

9 and OP 12

No glare found

9 and OP 14

No glare found

9 and OP 17

No glare found

9 and OP 18

No glare found

9 and OP 19

No glare found

9 and OP 49

No glare found

9 and OP 50

No glare found

9 and OP 54

No glare found

9 and OP 62

No glare found

9 and OP 80

No glare found

9 and OP 82

No glare found

9 and OP 96

No glare found

9 and OP 103

No glare found

9 and OP 118

No glare found

9 and OP 121

No glare found

9 and OP 131

No glare found

9 and OP 136

No glare found

9 and OP 146

No glare found

9 and OP 157

No glare found

9 and OP 158

No glare found

9 and OP 159

No glare found

9 and OP 169

No glare found

9 and OP 172

No glare found

9 and OP 173

No glare found

9 and OP 174

No glare found

9 and OP 175

No glare found

9 and OP 178

No glare found

9 and OP 182

No glare found

9 and OP 189

No glare found

9 and OP 197

No glare found

9 and OP 203

No glare found

9 and OP 208

No glare found

9 and OP 213

No glare found

9 and OP 243

No glare found

9 and OP 249

No glare found

9 and OP 250

No glare found

9 and OP 251

No glare found

9 and OP 349

No glare found

9 and OP 503

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
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.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
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.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

ForgeSolar default analysis parameters and observer eye characteristics, listed for reference only. The values used for this analysis are given in the site summary above.

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

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This analysis was conducted using the best available radiometric modeling at the time of generation. Future updates to the modeling methodology may yield different results.