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MEMORANDUM

To: Caldwell Solar, LLC - c/o Courtney Pelissero

From: Philip DeVita, HMMH

Date: January 6, 2022

Subject: Caldwell Solar, LLC Glare Analysis

Reference: HMMH Job No.309700.024

Introduction

Harris Miller Miller & Hanson Inc. (HMMH) completed a glare analysis on behalf of Caldwell Solar, LLC for the proposed up to 200 MW solar project located just northwest of Princeton, Kentucky in Caldwell County. The analysis evaluated potential glare from the proposed project on sensitive roadway observer locations on nearby Route 91, Route 641, and Interstate 69 along with nearby residences since no airports were identified within four miles of the project location. **Figure 1** shows the project location relative to Route 91 (to the east), Route 641 (to the west), and Interstate 69 (to the south).

HMMH used the latest version of the GlareGauge solar glare tool, formerly known as the Solar Glare Hazard Analysis Tool (SGHAT) developed by Sandia National Laboratories and Forgesolar to analyze potential glare at the roadway locations. GlareGauge is used to assess glare impacts at airport observation locations from solar photovoltaic (PV) projects and is currently the best tool available for analyzing solar glare impacts from PV projects and has the ability to simulate glare to observers along a continuous roadway segment and at residential locations. In lieu of specific county standards, model results were reviewed and compared relative to the 2013 Federal Aviation Administration's (FAA) Interim Policy of Solar Projects at Airports[1], specifically standards for pilots on final approach.

Design Parameters

In deploying the model, we selected the footprint of the solar project area of the Caldwell Solar, LLC solar array on the GlareGauge map interface and input the project design parameters provided by National Grid Renewables as shown in **Table 1.**

Table 1. Caldwell Solar, LLC Proposed Project Design Parameters

Solar System	*System*	*Orientation*	*Tilt Angle*	*Panel Height (AGL)*
Caldwell Solar, LLC Array	***Single Axis***	***180°***	***60°[1]***	***20 feet***

The Project is proposing up to 200 MW single axis tracking system with a tracking orientation north to south and a maximum tracking angle of 60°. The panels will be located on the ground, and a height of up to 20 feet above ground level was assessed for the modules.

[1] https://www.federalregister.gov/documents/2013/10/23/2013-24729/interim-policy-faa-review-of-solar-energy-system-projects-on-federally-obligated-airports

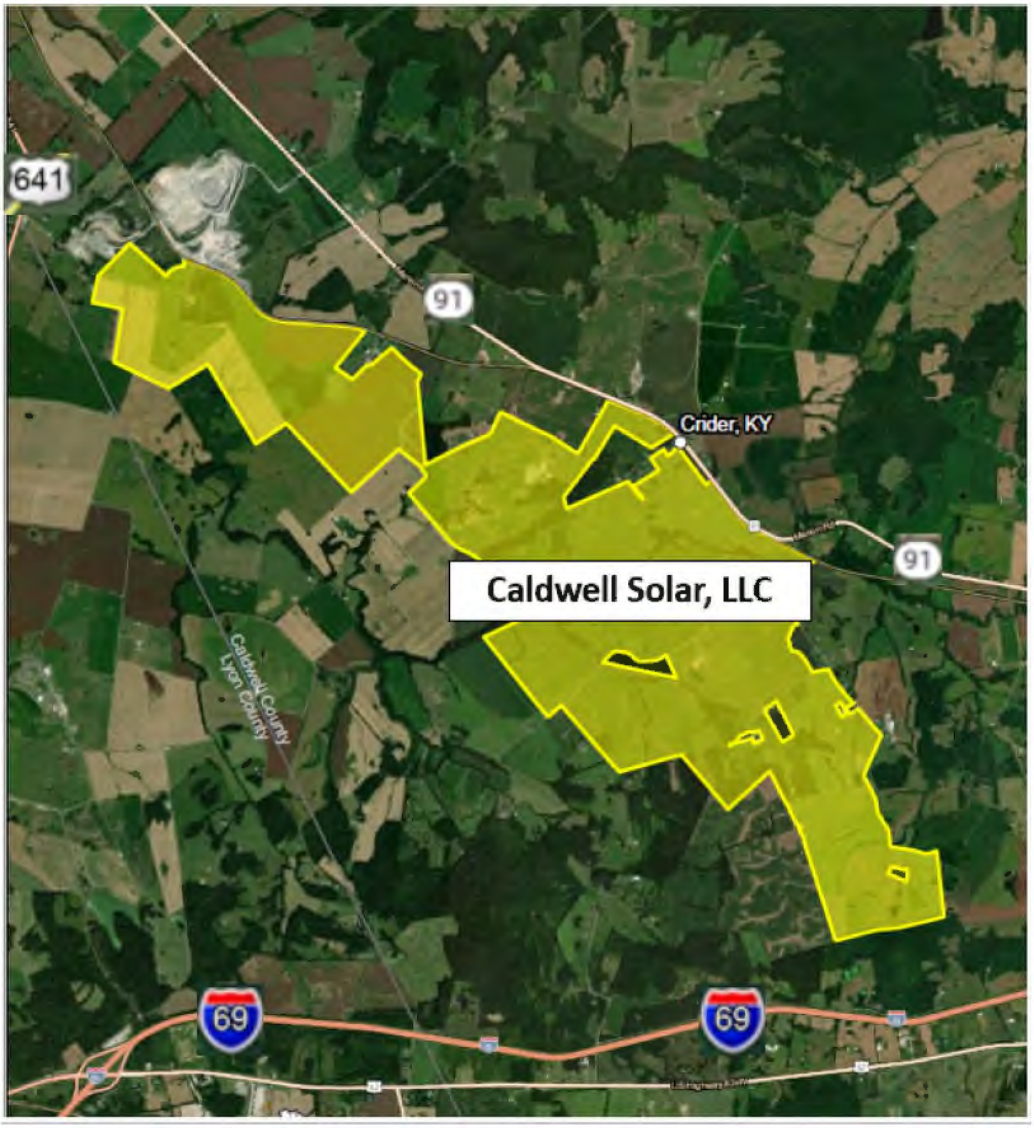


Figure 1. Caldwell Solar, LLC Relative to Nearby Route 91, Route 641 and Interstate 69

Background to FAA Airport Sensitive Receptors and Pilot Analysis

Interim Policy for Solar Projects at Airports as Published on October 23, 2013

To assess airport sensitive receptors, the FAA requires an evaluation of potential glare for pilots on final approach and at the air traffic control tower (ATCT). The FAA published an Interim Policy for Solar Projects at Airports on October 23, 2013. The policy clarifies the FAA's jurisdiction in reviewing solar projects and the standards it uses to determine if a project will result in a negative glare impact to airspace safety.

The Policy also describes the standards for measuring ocular impact:

To obtain FAA approval and a "no objection" to a Notice of Proposed Construction Form 7460-1, the airport sponsor will be required to demonstrate that the proposed solar energy system meets the following standards: (1) no potential for glint or glare in the existing or planned Air Traffic Control Tower cab, and (2) no potential for glare or "low potential for after-image" (shown in green) along the final approach path.

Table 2 presents the airport sensitive receptors that must be evaluated, the potential results presented by the GlareGauge model and whether the result complies with the FAA ocular hazard standard presented in the Policy.

Table 2. Levels of Glare and Compliance with FAA Policy

Airport Sensitive Receptor	Level of Glare	Color Result	Compliance with FAA Policy
ATCT Cab	No glare	None	Yes
	Low Potential for After-Image	Green	No
	Potential for After-Image	Yellow	No
	Potential for Permanent Eye Damage	Red	No
Aircraft along final approach path	No glare	None	Yes
	Low Potential for After-Image	Green	Yes
	Potential for After-Image	Yellow	No
	Potential for Permanent Eye Damage	Red	No

Any glare recorded on the ATCT is not compliant with FAA policy and will not receive a "no objection" determination from the FAA. Measurement of *low potential for after-image* or "Green" is acceptable for aircraft on final approach but greater levels (indicated in yellow and red) are not allowed.

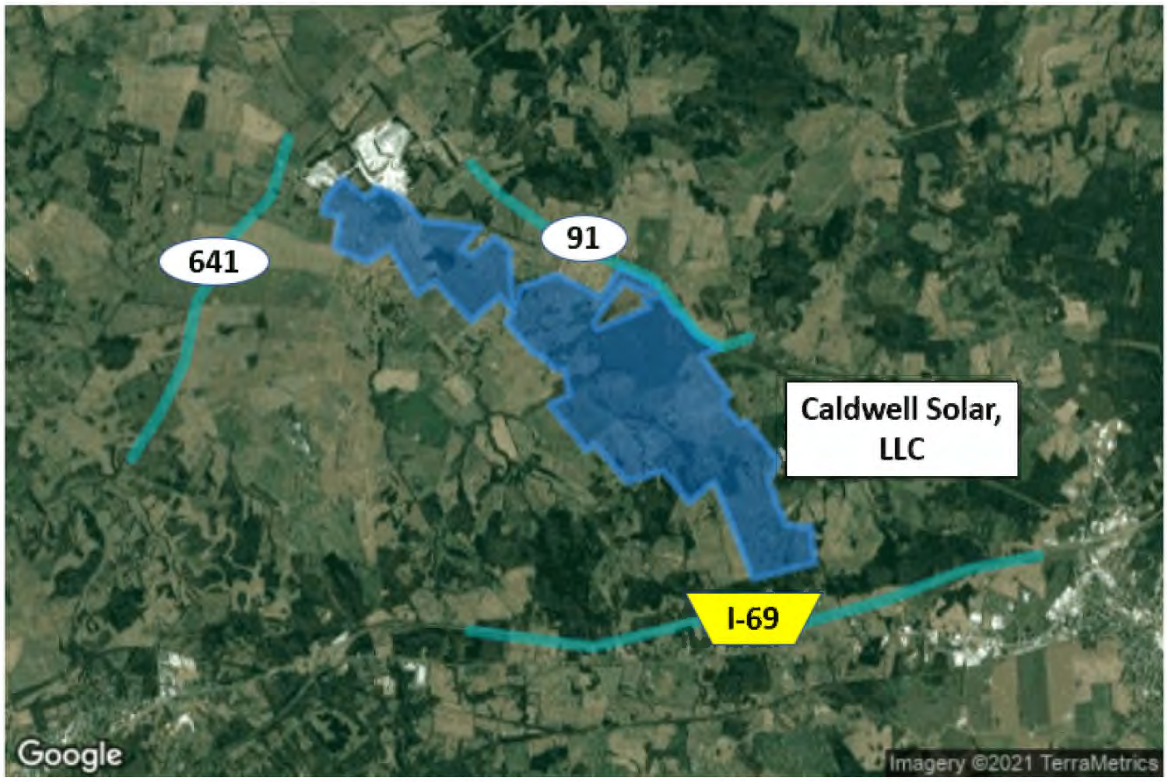
Summary of Results for Nearby Roadway and Residential Observation Locations

HMMH analyzed the potential for the Caldwell Solar, LLC Project to produce glare at nearby roadway and residential observation locations using GlareGauge. As discussed, the GlareGauge model is currently the best tool available for analyzing solar glare impacts from PV projects and is able to simulate glare from proposed solar PV projects to observers along a continuous roadway segment and at residential locations.

Methodology

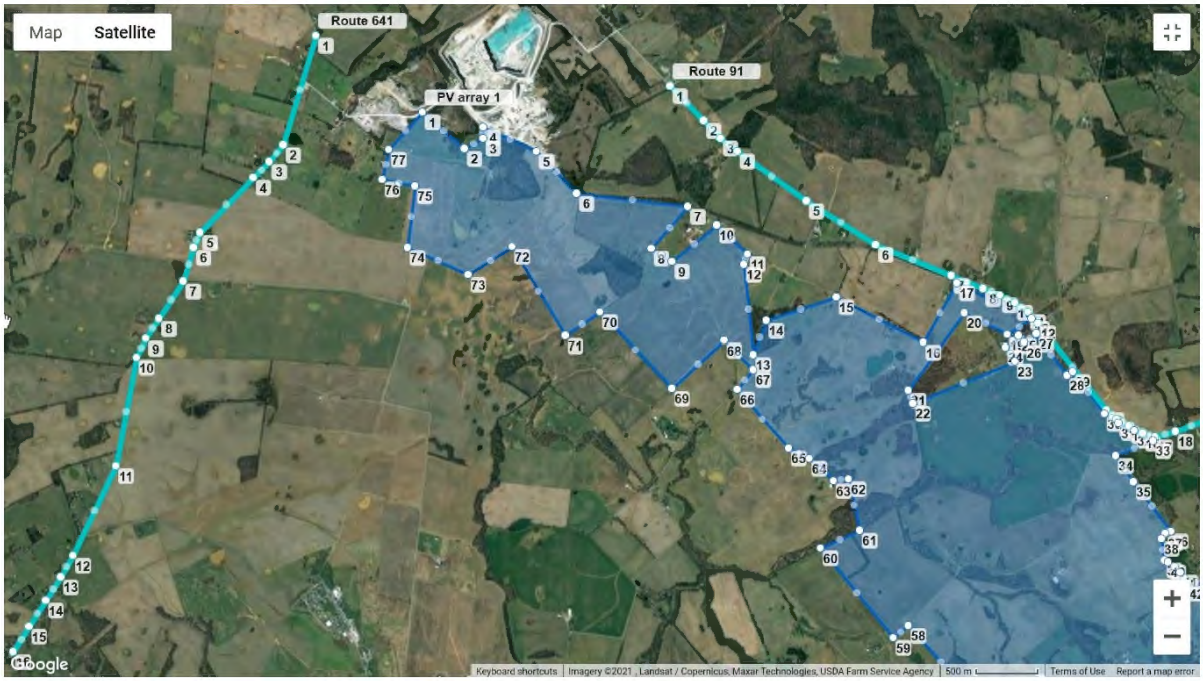
For the roadway analysis, the closest nearby main roadway of Route 91 which runs essentially southeast-northwest, Route 641 which runs northeast-southwest and Interstate 69 which essentially runs east-west were analyzed as they traverse near the project boundaries. **Figure 2** shows the Project array boundaries and roadway segment locations from the GlareGauge model selected for analysis, while **Figure 3** shows only the array boundaries as input into GlareGauge for the northern and southern portions of the project, respectively while **Figure 4** shows the array boundaries with the residence receptor locations as input into GlareGauge for the northern, central and southern portions of the project, respectively.

The roadway segments are depicted in light green/blue (teal) in **Figure 2** while the residence locations are depicted as red OP circle in **Figure 4**.

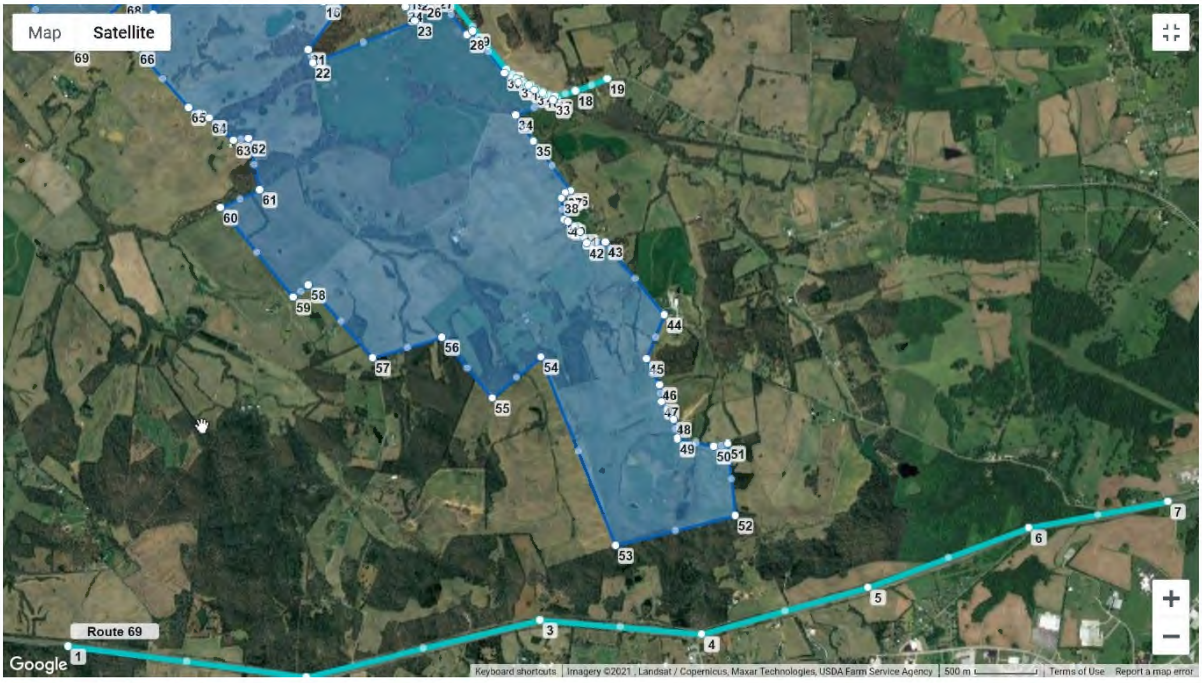


Source: GlareGauge

Figure 2 Route 91, Route 641 and Interstate 69 Roadway Segments Analyzed in GlareGauge

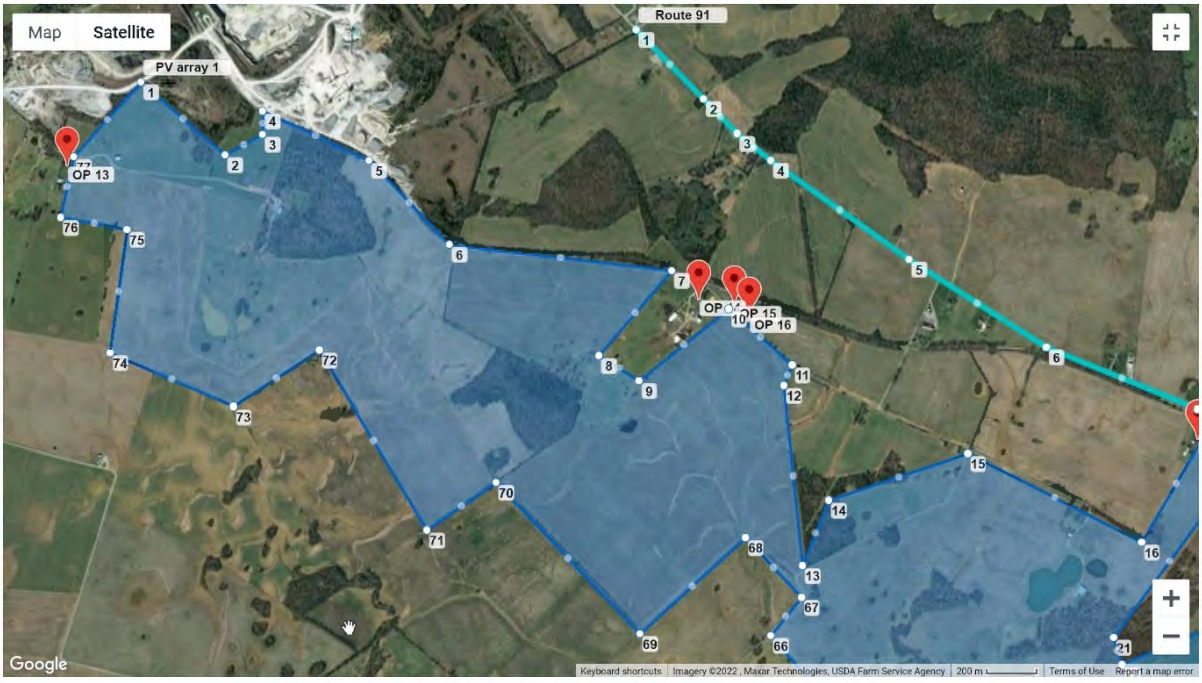


Source: GlareGauge



Source: GlareGauge

Figure 3 PV Array Boundaries Analyzed in GlareGauge (northern and southern boundaries)



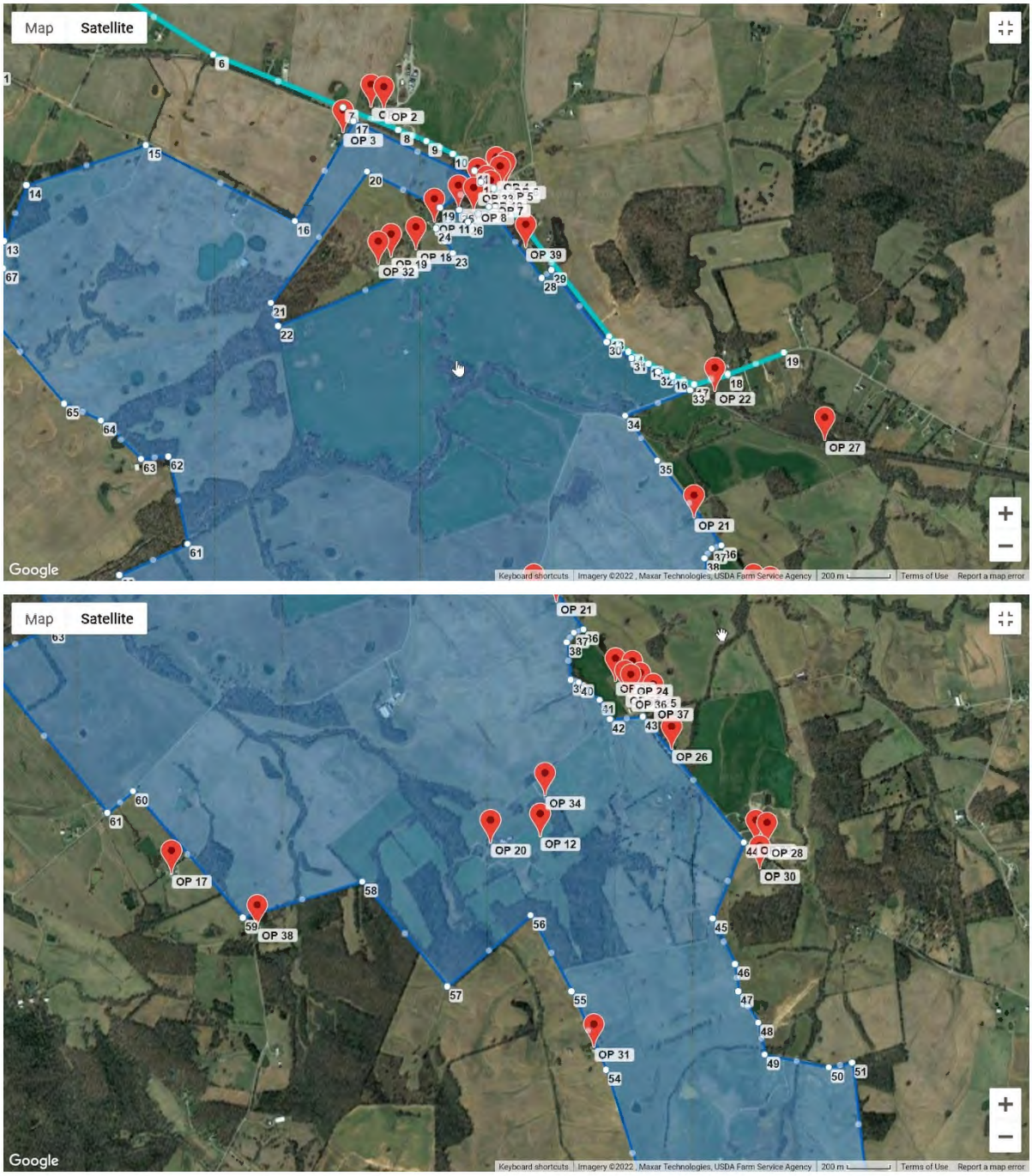
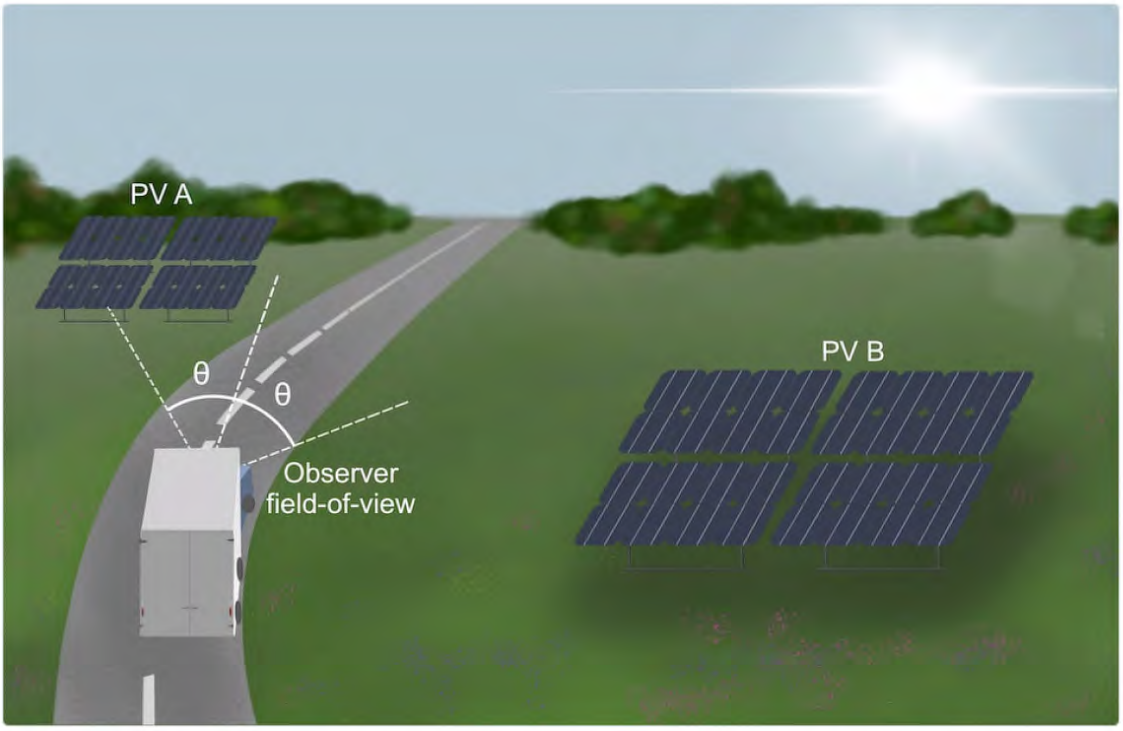


Figure 4 Residence Locations Analyzed in GlareGauge (northern, central and southern boundaries)

HMMH input the same specifications of the project array design parameters as described above in **Table 1**. A smooth panel surface without any anti-reflective coating was assumed to provide maximum flexibility in module selection.

The model was run for a full calendar year to calculate information for every sun position scenario over a typical year and the model assessed potential for glare at one-minute intervals. A viewing height of 6 feet above ground level was chosen as the height of the roadway observer as well as assuming two-way viewing meaning the observers travel along the route in both directions. A viewer default angle of 50°

was chosen as the field of view where the observer can see 50 degrees to the left and right for a total field of view of 100°. **Figure 5** shows a depiction of the route field of view in GlareGauge.



*Route receptor field-of-view is defined by view angle (theta) to left and right. Default FOV is 100° (i.e. 2 * 50° view angle).*

Source: GlareGauge

Figure 5. Route Receptor Field of View in GlareGauge

For the residential locations, each of the occupied locations were input into the model as observation point receptors assuming a viewing height of 6 feet above ground level. **Figure 6** shows an example of a few observer point locations input into Glaregauge. A total of 39 nearby residences were included in the Glaregauge.

Source: GlareGauge

Figure 6. Route Receptor Field of View in GlareGauge

It should be noted that this is a conservative approach for assessing glare at the roadways and residential locations as Glaregauge does not 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.

A summary of the model output is presented in **Table 3** for the Route 91, Route 641 and Interstate 69 road segments and residential observer locations. The modeling result output sheets for the roadway locations and residential locations are provided as **Attachment A** and denoted as Route 91, Route 641, and Route 69 in the model output as well as each of the 39 residential locations. As shown in **Table 3**, no glare was detected by the model for all of the PV locations located within the project perimeter to the nearby roadway and residential observer locations.

Table 3 – GlareGauge Results (in minutes per year) for the Caldwell Solar, LLC Project for Portions of Route 91, Route 641, Interstate 69, and Residential Locations

Site	Fixed/Tracker System	(orientation/tilt)	Route 91	Route 641	Interstate 69	Residential Locations[1]	Comply with FAA Thresholds for Pilots
Caldwell Solar, LLC	Single Axis Tracker	180° (max tracker of 60°)	0	0	0	0	Yes

Notes:

G (Green) = Low Potential for Temporary After-Image
Y (Yellow) = Potential for Temporary After-Image
R (Red) = Potential for Permanent Eye-Damage

N/A = Not applicable, no analysis conducted.

Additional Notes:

1. A total of 39 residential locations were included in the analysis as shown in **Figure 4**.

As discussed above, measurement of no or Low Potential for After-Image or Green is acceptable for aircraft on final approach, but greater levels (indicated in yellow and red) are not allowed.

Any potential solar glare to the vehicles traveling along the nearby roadways and residential locations is very similar or representative to aircraft along final approach in the FAA standards. Therefore in lieu of county specific standards, the standards of acceptable ocular impact as contained in the 2013 FAA policy for aircraft on final approach were applied to the vehicles traveling along these sections of Route 91, Route 641, and Interstate 69 and at residential locations. It should be noted that the model results are conservative in that the GlareGauge model does not consider potential obstacles associated with the landscape such as trees, buildings or hills which could block a direct view of the solar panels to the nearby observer locations.

Based on the design and layout of the Caldwell Solar, LLC Project as modeled, the GlareGauge modeling showed no glare detected at Route 91, Route 641, Interstate 69 observation points, and at residential locations, accordingly, the proposed design locations for these arrays within the project perimeter meets the 2013 FAA Standard for aircraft at each modeled observer location. *Therefore, there is no evidence based upon our modeling of the potential array locations that glare from the Project will cause an adverse impact for drivers along analyzed portions of Route 91, Route 641,Interstate 69, and nearby residential locations.*

Conclusions

HMMH utilized the GlareGauge model developed by the Department of Energy's Sandia National Laboratories and Forge Solar to evaluate potential glare from a proposed Caldwell Solar, LLC Project located just northwest of Princeton, Kentucky in Caldwell County. The analysis evaluated potential glare from the proposed project on sensitive roadway observer locations on nearby Route 91, Route 64,Interstate 69, and at nearby residential locations since no airports were identified within four miles of the project location.

GlareGauge is used to assess glare impacts at airport observation locations from solar photovoltaic (PV) projects for comparison to FAA Solar Glare Standards and is currently the best tool available for analyzing solar glare impacts from PV projects and has the ability to simulate glare to observers along a continuous roadway segment and at residential locations. In lieu of county standards, GlareGauge model results were compared to the 2013 FAA's ocular hazard standard for pilots to determine adverse impacts. **Attachment A** show the GlareGauge modeling results for the nearby roadway segments and residential locations.

Based on the preferred design and potential project boundaries of the Caldwell Solar, LLC Project, the GlareGauge modeling showed no glare detected at Route 91, Route 641, Interstate 69, and nearby residential observation points, accordingly, the proposed design and locations for these arrays meets the 2013 FAA Standard for aircraft at each modeled observer location. *Therefore, there is no evidence based upon our modeling of the potential array locations that glare from the Project will cause an adverse impact for drivers along analyzed portions of Route 91, Route 641, Interstate 69, and nearby residential locations.*

Attachment A

GlareGauge Modeling Results – Caldwell Solar, LLC - Project Design

ForgeSolar

Caldwell Solar LLC

Caldwell Solar LLC Revised 1-temp-1

Site description: Caldwell Solar LLC

Created Jan. 2, 2022
Updated Jan. 2, 2022
Time-step 1 minute
Timezone offset UTC-6
Site ID 63178.10435

Project type Advanced
Project status: active
Category 5 MW to 10 MW

Misc. Analysis Settings

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

Analysis Methodologies:
- Observation point: **Version 2**
- 2-Mile Flight Path: **Version 2**
- Route: **Version 2**

Summary of Results No glare predicted!

PV Name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
PV array 1	SA tracking	SA tracking	0	0	-

Component Data

PV Array(s)

Total PV footprint area: 3,034.4 acres

Name: PV array 1
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0 deg
Tracking axis tilt: 0.0 deg
Tracking axis panel offset: 0.0 deg
Maximum tracking angle: 60.0 deg
Resting angle: 60.0 deg
Footprint area: 3,034.4 acres
Rated power: -
Panel material: Smooth glass without AR coating
Vary reflectivity with sun position? Yes
Correlate slope error with surface type? Yes
Slope error: 6.55 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	37.172969	-88.031119	534.19	20.00	554.19
2	37.170301	-88.027278	470.06	20.00	490.06
3	37.171054	-88.025540	482.63	20.00	502.63
4	37.171909	-88.025540	491.83	20.00	511.83
5	37.170113	-88.020648	505.56	20.00	525.56
6	37.167032	-88.016952	481.20	20.00	501.20
7	37.166074	-88.006737	495.37	20.00	515.37
8	37.162962	-88.010106	529.49	20.00	549.49
9	37.162023	-88.008239	488.29	20.00	508.29
10	37.164674	-88.004119	476.60	20.00	496.60
11	37.162605	-88.001222	461.39	20.00	481.39
12	37.161852	-88.001608	467.03	20.00	487.03
13	37.155273	-88.000727	448.44	20.00	468.44
14	37.157685	-87.999547	468.56	20.00	488.56
15	37.159395	-87.993142	462.85	20.00	482.85
16	37.156155	-87.985148	480.42	20.00	500.43
17	37.160426	-87.982043	479.27	20.00	499.28
18	37.157820	-87.975192	466.31	20.00	486.31
19	37.156709	-87.977402	467.89	20.00	487.89
20	37.158265	-87.981307	472.41	20.00	492.41
21	37.152667	-87.986465	479.94	20.00	499.94
22	37.151675	-87.986078	479.99	20.00	499.99
23	37.154760	-87.976709	457.12	20.00	477.12
24	37.155820	-87.977611	471.60	20.00	491.60
25	37.156607	-87.976366	467.12	20.00	487.12
26	37.156111	-87.975894	476.35	20.00	496.35
27	37.156761	-87.974778	472.65	20.00	492.65
28	37.153725	-87.971938	473.86	20.00	493.86
29	37.154049	-87.971423	477.39	20.00	497.39
30	37.150974	-87.968465	487.15	20.00	507.15
31	37.150293	-87.967160	495.60	20.00	515.60
32	37.149715	-87.965747	496.69	20.00	516.69
33	37.148970	-87.964016	487.80	20.00	507.80
34	37.147876	-87.967470	473.66	20.00	493.66
35	37.145961	-87.965774	471.64	20.00	491.64
36	37.142331	-87.962348	483.45	20.00	503.45
37	37.142194	-87.962863	488.39	20.00	508.39
38	37.141784	-87.963250	488.88	20.00	508.88
39	37.140176	-87.963013	499.47	20.00	519.47
40	37.140073	-87.962606	499.15	20.00	519.15
41	37.139320	-87.961490	503.15	20.00	523.15
42	37.138479	-87.960909	502.89	20.00	522.90
43	37.138581	-87.959171	513.29	20.00	533.29
44	37.133230	-87.953775	568.54	20.00	588.54
45	37.129997	-87.955448	596.63	20.00	616.63
46	37.128061	-87.954247	600.52	20.00	620.52
47	37.126881	-87.954075	613.37	20.00	633.37
48	37.125574	-87.952963	570.51	20.00	590.51
49	37.124198	-87.952619	557.57	20.00	577.57
50	37.123651	-87.949208	585.70	20.00	605.70
51	37.123839	-87.947963	569.70	20.00	589.70
52	37.118613	-87.947236	634.31	20.00	654.31

53	37.116389	-87.958286	695.17	20.00	715.17
54	37.123544	-87.961138	604.66	20.00	624.66
55	37.126900	-87.962993	565.99	20.00	586.00
56	37.130152	-87.965148	584.23	20.00	604.23
57	37.127109	-87.969627	543.89	20.00	563.89
58	37.131590	-87.974182	540.82	20.00	560.82
59	37.130057	-87.980595	555.22	20.00	575.22
60	37.135399	-87.986469	495.76	20.00	515.76
61	37.134492	-87.987843	490.84	20.00	510.85
62	37.141063	-87.994585	452.44	20.00	472.44
63	37.142380	-87.990938	466.98	20.00	486.98
64	37.146122	-87.991954	493.29	20.00	513.29
65	37.146020	-87.993392	476.01	20.00	496.01
66	37.147661	-87.995568	459.12	20.00	479.12
67	37.148380	-87.997521	445.56	20.00	465.56
68	37.152724	-88.002220	435.91	20.00	455.91
69	37.154126	-88.000783	448.21	20.00	468.21
70	37.156298	-88.003379	441.75	20.00	461.75
71	37.152792	-88.008228	443.57	20.00	463.57
72	37.158334	-88.014834	439.86	20.00	459.86
73	37.156589	-88.018015	432.12	20.00	452.12
74	37.163152	-88.022916	432.44	20.00	452.44
75	37.161100	-88.026885	420.43	20.00	440.43
76	37.163067	-88.032529	440.08	20.00	460.08
77	37.167581	-88.031778	442.58	20.00	462.58
78	37.168025	-88.034803	456.50	20.00	476.50
79	37.170248	-88.034224	478.66	20.00	498.66

Route Receptor(s)

Name: Route 641
Route type Two-way
View angle: 50.0 deg

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	37.178601	-88.040932	453.91	6.00	459.91
2	37.170606	-88.043898	448.39	6.00	454.39
3	37.169325	-88.045169	451.33	6.00	457.33
4	37.168182	-88.046677	455.52	6.00	461.52
5	37.164168	-88.051580	471.15	6.00	477.15
6	37.163073	-88.052159	465.43	6.00	471.43
7	37.160611	-88.053082	480.13	6.00	486.13
8	37.157849	-88.055313	466.15	6.00	472.15
9	37.156443	-88.056526	460.98	6.00	466.98
10	37.155070	-88.057373	453.64	6.00	459.65
11	37.147098	-88.059298	425.30	6.00	431.30
12	37.140541	-88.063262	431.39	6.00	437.39
13	37.138949	-88.064382	436.08	6.00	442.08
14	37.137271	-88.065717	412.65	6.00	418.65
15	37.135371	-88.067255	408.63	6.00	414.63
16	37.133471	-88.068729	427.41	6.00	433.41

Name: Route 69
Route type Two-way
View angle: 50.0 deg

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	37.109015	-88.008589	531.98	6.00	537.98
2	37.106756	-87.986692	586.66	6.00	592.66
3	37.110931	-87.965223	583.71	6.00	589.71
4	37.109904	-87.950396	570.39	6.00	576.39
5	37.113275	-87.935054	550.82	6.00	556.82
6	37.117673	-87.920313	512.83	6.00	518.83
7	37.119623	-87.907567	534.29	6.00	540.29

Name: Route 91
Route type Two-way
View angle: 50.0 deg

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	37.174893	-88.008364	521.77	6.00	527.77
2	37.172354	-88.005290	514.99	6.00	520.99
3	37.171089	-88.003742	530.45	6.00	536.45
4	37.170089	-88.002184	498.03	6.00	504.03
5	37.166481	-87.995872	468.79	6.00	474.79
6	37.163275	-87.989534	457.10	6.00	463.10
7	37.161013	-87.982585	474.61	6.00	480.61
8	37.160053	-87.979620	472.61	6.00	478.61
9	37.159569	-87.978116	468.93	6.00	474.93
10	37.159008	-87.976697	465.49	6.00	471.49
11	37.158307	-87.975544	463.18	6.00	469.18
12	37.157542	-87.974535	462.83	6.00	468.83
13	37.151214	-87.968323	488.39	6.00	494.39
14	37.150566	-87.967331	493.71	6.00	499.72
15	37.150047	-87.966242	496.51	6.00	502.51
16	37.149534	-87.964933	486.20	6.00	492.20
17	37.149209	-87.963796	489.00	6.00	495.00
18	37.149619	-87.961972	490.26	6.00	496.26
19	37.150522	-87.959002	484.62	6.00	490.62

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 1	37.161000	-87.981100	486.70	6.00	492.70
OP 2	37.160900	-87.980400	492.00	6.00	498.00
OP 3	37.159900	-87.982600	494.70	6.00	500.70
OP 4	37.157900	-87.974400	469.06	6.00	475.06
OP 5	37.157500	-87.974200	468.80	6.00	474.80
OP 6	37.157700	-87.973900	470.02	6.00	476.02
OP 7	37.156900	-87.974700	472.46	6.00	478.46
OP 8	37.156600	-87.975600	474.63	6.00	480.63
OP 9	37.156700	-87.976400	465.77	6.00	471.77
OP 10	37.157100	-87.974900	472.73	6.00	478.73
OP 11	37.156100	-87.977700	478.34	6.00	484.34
OP 12	37.140100	-87.972400	523.47	6.00	529.47
OP 13	37.169900	-88.034500	477.36	6.00	483.36
OP 14	37.165000	-88.005500	484.44	6.00	490.44
OP 15	37.164800	-88.003900	480.93	6.00	486.93
OP 16	37.164400	-88.003200	478.43	6.00	484.43
OP 17	37.131900	-87.984400	549.78	6.00	555.78
OP 18	37.154900	-87.978700	478.27	6.00	484.27
OP 19	37.154600	-87.980000	475.53	6.00	481.53
OP 20	37.133200	-87.967300	564.91	6.00	570.91
OP 21	37.143500	-87.963800	497.16	6.00	503.16
OP 22	37.148900	-87.962700	493.98	6.00	499.98
OP 23	37.140100	-87.960600	521.68	6.00	527.68
OP 24	37.140000	-87.959700	523.11	6.00	529.11
OP 25	37.139500	-87.959300	527.52	6.00	533.52
OP 26	37.137200	-87.957600	524.24	6.00	530.24
OP 27	37.146800	-87.956800	490.81	6.00	496.81
OP 28	37.133100	-87.952500	555.01	6.00	561.01
OP 29	37.133200	-87.953100	565.69	6.00	571.69
OP 30	37.132100	-87.952900	568.31	6.00	574.31
OP 31	37.124500	-87.961800	628.74	6.00	634.74
OP 32	37.154300	-87.980700	469.23	6.00	475.23
OP 33	37.157400	-87.975400	467.37	6.00	473.37
OP 34	37.135200	-87.964400	534.94	6.00	540.94
OP 35	37.139600	-87.960100	525.26	6.00	531.26
OP 36	37.139400	-87.959800	527.26	6.00	533.26
OP 37	37.139000	-87.958600	522.05	6.00	528.06
OP 38	37.129600	-87.979800	548.08	6.00	554.09
OP 39	37.155000	-87.972800	475.91	6.00	481.91

Summary of PV Glare Analysis

PV configuration and total predicted glare

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

PV & Receptor Analysis Results

Results for each PV array and receptor

PV array 1 no glare found

Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	0
OP: OP 5	0	0
OP: OP 6	0	0
OP: OP 7	0	0
OP: OP 8	0	0
OP: OP 9	0	0
OP: OP 10	0	0
OP: OP 11	0	0
OP: OP 12	0	0
OP: OP 13	0	0
OP: OP 14	0	0
OP: OP 15	0	0
OP: OP 16	0	0
OP: OP 17	0	0
OP: OP 18	0	0
OP: OP 19	0	0
OP: OP 20	0	0
OP: OP 21	0	0
OP: OP 22	0	0
OP: OP 23	0	0
OP: OP 24	0	0
OP: OP 25	0	0
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
OP: OP 36	0	0
OP: OP 37	0	0
OP: OP 38	0	0
OP: OP 39	0	0
Route: Route 641	0	0
Route: Route 69	0	0
Route: Route 91	0	0

No glare found

Assumptions

- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not 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 V1 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.
- Refer to the **Help page** for detailed assumptions and limitations not listed here.