BEFORE THE OHIO POWER SITING BOARD

In the Matter of the Application of Blossom Solar, LLC for a Certificate of Environmental Compatibility and Public Need	))))	**Case No. 22-151-EL-BGN**

NOTICE OF FILING RESPONSES TO STAFF DATA REQUESTS

On May 27, 2022, Blossom Solar, LLC ("Blossom") filed an Application for a Certificate of Environmental Compatibility and Public Need with the Ohio Power Siting Board (the "Board"). On June 21, 2022, June 28, 2022, and July 1, 2022, Board Staff sent data requests pertaining to the Application. Attached to this notice are copies of Blossom Solar's responses, previously submitted to Staff.

Respectfully submitted,

/s/ Anna Sanyal
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Attorneys for Blossom Solar, LLC

BEFORE
THE OHIO POWER SITING BOARD

In the Matter of the Application of	**)**	
Blossom Solar, LLC for a	**)**	
Certificate of Environmental	**)**	**Case No. 22-151-EL-BGN**
Compatibility and Public Need	**)**	

Blossom Solar, LLC's June 22, 2022 and July 11, 2022 Responses to Staff's June 21, 2022, and June 28, 2022 Data Requests

1. On June 21, 2022, Staff requested that the GIS files previously uploaded to Staff's sharesite be updated.

Response: On June 22, 2022, the Applicant uploaded updated GIS files to Staff's sharesite.

2. Provide a description of how many and what types of comments have been received from the public regarding the project.

Response: As of July 8, 2022 there have been three public comments (two in support one in opposition) posted to the docket. Among other things, the two comments supportive of the Project note that companies relocating to Ohio are seeking clean energy, the positive economic activity the Project will generate, especially for local schools, and landowners' right to make decisions about their property. Although the Applicant received general verbal comments during the April 6, 2022 public information meeting, it did not receive any formal, written comments.

BEFORE
THE OHIO POWER SITING BOARD

In the Matter of the Application of	**)**	
Blossom Solar, LLC for a	**)**	
Certificate of Environmental	**)**	**Case No. 22-15-EL-BGN**
Compatibility and Public Need	**)**	

Blossom Solar, LLC's July 15, 2022 Responses to Staff's July 1, 2022 Data Requests

1. **Please provide Staff with an Unanticipated Discovery Plan which includes course(s) of action to be taken in the event previously unidentified subsurface hazards/features are encountered during construction (e.g., oil and gas well infrastructure, abandoned mines, contaminated soils, etc.).**

   ***Response**: Applicant plans to provide a preliminary plan to Staff by July 20, 2022.*

2. **Page 2-5 of Exhibit M (Geology and Hydrogeology Report by Burns McDonnell) indicates there are six abandoned oil and gas wells located "within the Site". Please identify these wells by their assigned API number and confirm whether these wells have been plugged. In addition, provide minimum distances between these wells and any proposed project infrastructure.**

   ***Response**: See the table in **Attachment 1** for the requested information.*

3. **Exhibit M indicates there are several water wells within the project area. Please identify these wells by their ODNR assigned unique water well ID Number and confirm whether these wells have been plugged. In addition, provide minimum distances between these water sources and any proposed project infrastructure.**

   ***Response**: See the table in **Attachment 2** for the requested information.*

4. **Exhibit M indicates a source water protection area has been delineated .3 miles northeast of the project area at Sycamore Creek Golf Course. Please confirm this property's status with Ohio EPA's Source Water Assessment and Protection Program.**

   ***Response**: Applicant plans to submit this information to Staff by July 20, 2022.*

5. **Provide Staff with a figure depicting highly erodible soils and/or slopes of 12% slope or greater within the study area which also includes depiction of planned project infrastructure.**

   Response*: See* ***Attachment 3*** *for a map depicting highly erodible soils and slopes of 12% or greater within the project area along with the planned project infrastructure.*

6. **What is the distance between the proposed substation and the nearest geotechnical boring collected to date?**

   Response: *The distance between the proposed substation and the nearest geotechnical boring location is approximately 595 feet. The nearest boring is Log B-2 as described in the Preliminary Geotechnical Engineering Report provided as Exhibit N to the Application.*

Manufacturer Information

7. **Referring to Exhibit B of the Application, what solar panel manufacturers are Blossom Solar, LLC considering for this project?**

   Response*: Applicant is considering the use of a number of manufacturers for the Project. For reasons of business confidentiality, Applicant prefers not to identify the manufacturers under consideration. The manufacturer that Applicant ultimately selects will be identified in the final design to be submitted to Staff prior to construction.*

8. **Does Blossom Solar, LLC anticipate using more than one solar panel manufacturer for this project?**

   Response*: Applicant does not anticipate using more than one solar panel manufacturer, but that will not be determined until the final design of the Project is complete.*

9. **Have the solar panels under consideration by Blossom Solar, LLC passed the US EPA's Toxicity Characteristic Leaching Procedure (TCLP) test?**

   Response*: Models of solar panels under consideration by Applicant have been tested under the TCLP and the results show that, if disposed of in a landfill, it would qualify as non-hazardous waste under applicable federal requirements, including the Resource Conservation and Recovery Act ("RCRA"). As further explained in page 34 of the*

Application, the Applicant believes that the vast majority of ground-mount solar panels sold in the U.S. qualify as non-hazardous waste under RCRA and the TCLP. Any model of solar panel that Applicant uses for the Project and that is disposed of as part of the decommissioning of the Project will be disposed in accordance with applicable federal and state law, including the RCRA.

10. Will Blossom Solar, LLC only consider using solar panels that do not exhibit the characteristic of toxicity through analysis with the US EPA's TCLP test?

***Response**: Although Applicant is currently not considering panels that have not been tested or do not pass the TCLP, Applicant does not believe that it is necessary to consider only such panels because solar panels are safe during operation. Further, at the time of disposal, the Applicant will be required to dispose of panels in accordance with applicable federal and state law, including RCRA.*

11. Referring to page 4 of the Application, will Blossom Solar, LLC select a solar panel that is listed as a Bloomberg New Energy Finance tier 1 solar panel supplier/manufacturer? If no, is there any other standard that Springwater Solar intends to use in its selection of manufacturer(s)?

***Response**: Yes, assuming Bloomberg NEF is still issuing its quarterly PV Module Tier 1 List at that time that Applicant selects the manufacturer for the Project and does not substantially change its methodology for creating the list, Applicant will select a manufacturer from that reference.*

<u>138 kV Generation Interconnection (Gen-tie) Transmission Line</u>

12. Please provide the following information for the gen-tie transmission line:

a. Tower designs, pole structures, conductor size and number per phase, and insulator arrangement.

b. Base and foundation design.

c. Cable type and size, where underground.

d. Other major equipment or special structures.

***Response**: The gen-tie will be buried at a minimum depth of three feet until it reaches property owned by FirstEnergy on which the existing Galion 138kV switchyard is located. Applicant is working with FirstEnergy to refine the design of the portion of the gen-tie route to be located on the FirstEnergy property. The gen-tie will continue on the*

FirstEnergy property until it reaches the switchyard, where it will connect to an above-ground termination structure inside the fence of the switchyard. The portion of the gen-tie on FirstEnergy's property may be buried or overhead. The most recent preliminary design of the portion of the gen-tie on FirstEnergy's property is provided as ***Attachment 4****. Note that this route should cause fewer impacts than the route shown on the Preliminary-Maximum Site Plan that was provided as Exhibit A to the Application.*

See below for responses to each specific question. These responses assume that the portion of the gen-tie located on the FirstEnergy property will be overhead. If the gen-tie is buried, then there will be no above ground structures, except for any termination structure near the switchyard.

a. Tower designs, pole structures, conductor size and number per phase, and insulator arrangement.

Response*: The preliminary design calls for the three overhead-underground riser structures to be self-supporting steel monopole structures. Two wood-pole tangent structures and one guyed wood-pole dead-end structure would also be utilized. The preliminary design would utilize single 795 kcmil ACSR conductor for each phase. The riser structures and corner dead-end structure would have insulator assemblies installed in a vertical arrangement. The two wood-pole tangent structures would have insulators installed in a delta configuration.*

b. Base and foundation design.

Response*: The preliminary design calls for the steel-pole riser structures to be supported on drilled shaft foundations. The wood-pole structures would be direct embedded.*

c. Cable type and size, where underground.

Response*: The preliminary design calls for the underground portion of the Gen-tie to be comprised of crosslinked polyethylene (i.e., XLPE)-insulated, polyethylene (i.e. PE)-jacketed, 1,000 thousand circular mills (i.e., kcmil) aluminum conductor.*

d. Other major equipment or special structures.

Response: *No other major equipment or special structures are anticipated, but the possible need for any such equipment will be addresses at final site design.*

13. Provide the following information for the any substation support structures:

a. Tower designs, pole structures, conductor size and number per phase, and insulator arrangement.

***Response*:** *The substation will contain the types of structures, types and size of conductors typical in the electric industry in Ohio. This preliminary information is subject to change and will be confirmed upon final site design.*

b. Base and foundation design.

***Response*:** *The substation will contain the types of foundation designs typical in the electric industry in Ohio. This preliminary information is subject to change and will be confirmed upon final site design.*

c. Cable type and size, where underground.

***Response*:** *In addition to the underground cables used for the 138kV interconnection line and collection lines covered in questions #12 and #17, respectively, underground cables are expected to be low voltage (for power and control), which is generally 240 volts for AC cables and 125 volts for DC cables. This preliminary information is subject to change and will be confirmed upon final site design.*

d. Other major equipment or special structures.

Response*: No other major equipment or special structures are anticipated, but the possible need for any such equipment will be addresses at final site design.*

14. Is the proposed gen-tie transmission line within one hundred feet of an occupied residence or institution? If yes, please provide the calculated electric and magnetic field strength levels at one meter above ground, under the conductors and at the edge of the right-of-way for (i) Winter normal conductor rating, (ii) Emergency line loading, and (iii) Normal maximum loading.

Response*: No.*

15. Blossom Solar, LLC seems to indicate that the gen tie transmission line is still under design. Please provide the 10% design or better (i.e., overhead plans, transmission line plan and profile view) for the gen tie transmission line.

***Response**: See response to question #12, the Preliminary-Maximum Site Plan provided as Exhibit A to the Application, and a revised page CS100 of the Preliminary-Maximum Site Plan that is provided as* **Attachment 5**.

16. Page 9 of the Application indicates that the gen-tie will be mostly buried. Please further explain what length of the gen-tie line would be buried and delineate on Figure 2 (Map of Aerial View of Project Area) the portion of the gen-tie line that would be underground.

***Response**: See answer to Question 12. The revised page CS100 of the Preliminary-Maximum Site Plan (*Attachment 5) *includes a call-out box and arrow showing the portion of the gen-tie that may be overhead. The revised page CS100 shows that at least approximately 4,218 feet of the gen-tie—starting from the project substation until it reaches FirstEnergy's property—will be buried. At this point, as shown on the revised page CS100, approximately 1,350 feet will either be buried or overhead until it reaches the fenceline of the switchyard.*

<u>Project Description: Electric Collection Lines</u>

17. When a collection cable leaves the inverter does it join the cables of other inverters in series or parallel?

***Response**: The collection cables likely will join the cables of other inverters in both series and parallel. Based on the preliminary design shown in the Preliminary-Maximum Site Plan provided as Exhibit A to the Application, seven to nine inverters are expected to be wired in series, and where practical will be collocated with other circuit cables routing to the project substation. This information is preliminary and is subject to change and as part of final site design.*

18. Are the underground electric collection cables installed inside a conduit?

***Response**: Applicant expects that the collection cables will be direct buried, however, conduits could be utilized in certain situations (e.g. bore crossings, etc.). This information is preliminary and subject to change as part of the final site design.*

19. If cables run parallel would parallel cables be installed inside one conduit or would each cable get its' own conduit.

***Response**: If applicable, individual phases of the same circuit would run together in one conduit, however multiple parallel circuits may have their own conduit. This information is preliminary and subject to change as part of final site design.*

20. What is the gauge of the underground electric collection cables?

***Response**: Underground collection cables are expected to vary in sizes from 4/0 up to 1250kcmil. This information is preliminary and is subject to change as part of final site design.*

21. If running in parallel, what is the maximum number of cables that would be running alongside each other at any given point?

***Response**: Based on the preliminary design shown in the Preliminary-Maximum Site Plan provided as Exhibit A to the Application, Applicant expects that there will be a maximum number of seven cables running alongside each other. This information is preliminary and is subject to change as part of final site design.*

22. Inside the project area, how many linear feet of underground cables will there be per acre?

***Response**: Based on the Preliminary-Maximum Site Plan that is provided as Exhibit A to the Application, Applicant expects that there will be roughly 272 linear feet of cabling per acre included in the project area. This information is preliminary and is subject to change based on final site design.*

23. With cables that run parallel how many feet would be between the cables?

***Response**: Spacing of underground cables will be determined by an ampacity study to be conducted as part of final site design. Applicant expects that much of the spacing will be between three to six feet between cables depending on the size of cable, the thermal resistivity of the soil, and other variables. If sub-surface conditions are poor, this spacing may be greater.*

<u>Grading</u>

24. Provide a grading plan that includes but is not limited to the following: (a) preconstruction and proposed one-foot contours referenced to U.S. Geological

Survey datum; (b) drainage arrows which delineate preconstruction and proposed drainage patterns; (c) estimated earthwork quantities including the amount of cut and fill and the amount of soil to be exported or imported (in cubic yards); and (d) Location of proposed areas of cut and fill, including the extent and maximum depth of cut and fill.

***Response**: Applicant will be in a position to provide a detailed grading plan based on final site design of the facility prior to the start of construction. Grading information available based on the Preliminary-Maximum Site Plan provided as Exhibit A to the Application is fairly limited. The selection of the equipment, particularly the racking and its associated slope tolerance, will determine the type and location of needed earthwork. Similarly, the final design of the arrays themselves, such as typical row spacing and the project's associated ground-coverage ratio, will also determine the type and location of earthwork. Subject to this general qualification, see below for responses to each specific question:*

a. *Applicant has conducted an aerial topography survey using LiDAR technology, which generated 1-foot contour data for the current project area. Applicant will upload this data to Staff's sharefile.*

b. *Figure 1 of the Stormwater Assessment provided as Exhibit K to the Application depicts the project area's current drainage patterns.*

c. *The Applicant does not expect to export any soil from the site and any imported soil is expected to be limited to top soil that may be needed to supplement on-site resources to establish project vegetation.*

d. *Areas that may call for cut-and-fill can be determined based on final design, but areas with slopes of 10% or more are candidates.*

<u>Aviation</u>

25. What is the height of the tallest structure at the solar farm including project substation?

***Response**: 80 feet*

26. Provide what the height of the following structures at the solar farm would be

a. gen-tie transmission line support structures

b. Lightning mast at the collection substation

***Response**: The height of the gen-tie transmission support structures is expected to be from 25 to 50 feet, and the height of the lightning mast(s) is expected to be between 50 and 70 feet (possibly as high as 80 feet).*

Decommissioning

27. Page 3-1 of Exhibit J (Preliminary Decommissioning Plan), indicates that decommissioning activities would be completed within 6 months. Please confirm that all above ground solar equipment would be removed within that timeframe.

***Response**: As noted in the Application narrative and the Preliminary Decommissioning Plan provided as Exhibit J to the Application, Applicant expects that on-site decommissioning activities will be completed within 6 months. Based on a variety of factors that are difficult or impossible to control, such as weather and labor availability, it is possible that such activities could take up to 12 months.*

28. Page 3-1 of Exhibit J (Preliminary Decommissioning Plan), states that "Additional time may be required for post-decommissioning activities, including monitoring of new vegetation."

a. Please explain what decommissioning activities would occur after six months.

***Response:** After the equipment itself is removed, on-site decommissioning activities that may take longer than six months include ripping and disking of topsoil to de-compact it in certain locations (e.g. former locations of roads and inverters), taking soil samples (for instance, to check pH levels), conducting other soil remediation activities such as adding supplemental topsoil, seeding of temporary vegetation, and monitoring of temporary vegetation.*

b. Please explain the anticipated time necessary to complete those activities.

***Response:** See response to Question 27.*

c. Please explain the anticipated time necessary to complete monitoring of new vegetation.

***Response**: See response to Question 27.*

29. In the Exhibit J (Preliminary Decommissioning Plan), Blossom Solar, LLC seems to indicate that buried collection cables more than 3 feet below grade would not be

removed. Given that drain tile mains can be installed as deep as six feet, how will electric lines be removed so as to not impact future use?

***Response**: Applicant does not believe that collection lines left in place as part of decommissioning will impact the functioning of any drain tile mains at the site. For those collection lines that are removed as part of decommissioning, as with construction, such activities would need to be conducted with attention to the integrity of any main drain tile that may be affected. For instance, if the removal of any collection line damaged or required work to be done to a main drain tile, then that main drain tile would need to be promptly repaired.*

30. If drain tiles need to be installed at depths of 6 feet, how will the possibility of steel piles or other foundation equipment left in place at a depth of 3 feet and buried collection lines impact the ability to drain the project area after decommissioning?

***Response**: Applicant does not believe that collection lines or broken piles left in place as part of decommissioning would have the potential to impact the functioning of any drain tile mains at the site. The physical space occupied by any such collection lines and piles would be minimal and not sufficient to affect subsurface drainage patterns or the functioning of the drain tile itself. As with other subsurface obstacles, such as rock and small boulders, water that absorbs into the ground, assisted by gravity, will "find its way" to the drain tile lines and be removed from the subsurface of the field.*

Wind Velocity, Ohio Adm.Code 4906-4-08 (A)(6)

31. In accordance with Ohio Adm.Code 4906-4-08(A)(6), please provide an analysis of high wind velocities for the area around the Blossom Solar Project, Morrow County.

***Response**: Applicant plans to provide this information to Staff by July 18, 2022.*

32. Provide the range of wind velocities that have been experienced and would be expected to be observed in Blossom Solar Project's project area Morrow County, along with the probabilities or probability distribution for these velocities.

***Response**: Applicant plans to provide this information to Staff by July 18, 2022.*

33. Describe the plans to mitigate any likely adverse consequences that would be the result of high wind velocities.

***Response**: Adverse consequences resulting from high wind velocities are highly unlikely to occur at the Project because of its inherently stable design. The racking system, including the tracker system, and other major equipment for the Project will be structurally engineered to account for high wind gust speeds as specified by consensus industry standards such as ASCE/SEI 7-16, Minimum Design Loading and Associated Criteria for Buildings and Other Structures published by the American Society of Civil Engineers. Such standards provide reference wind load criteria for solar facility design. Hazard wind speeds will be adjusted based on site-specific risk factors, meaning that the Project's structural design will account not only for area wind speeds, but for site-specific features such as soil characteristics, with some additional safety factor. Additionally, the structural design for the Project will be approved by a licensed professional engineer.*

34. Explain what building code or wind speed the solar facility will be designed to withstand.

***Response**: See answer to Question 33.*

35. Indicate any wind loading precautions or wind equipment ratings that will be included in the final project design.

***Response**: See answer to Question 33. Although the final design of the Project may call for a different tracker system, Applicant notes that the representative model of tracker identified in the Representative Component Models provided as Exhibit B to the Application and used in the Preliminary-Maximum Site Plan provided as Exhibit A to the Application, is designed to withstand wind gusts of up to 145 miles per hour.*

36. Do the trackers under consideration have a stow mode?

***Response**: The representative model of tracker in Representative Component Models provided as Exhibit B to the Application includes a stow mode, but such a mode is not necessary for safe design with respect to wind and may vary by manufacturer.*

<u>Emergency Response Plan</u>

37. Will the emergency response plan for the project referenced on page 48 of the Application be provided to OPSB Staff prior to the preconstruction conference?

***Response**: Yes.*

38. Provide the current draft emergency response plan or an example emergency response plan.

***Response**: An example of an emergency response plan is provided as **Attachment 6**.*

Local jurisdiction(s)

39. Has Morrow County or Washington township, passed any ordinances or resolutions that limit the development of, or pertain to, utility scale solar development in the Blossom Solar project area? If so, please provide that ordinance or resolution.

***Response**: Yes, Morrow County has passed such an ordinance (Morrow County regulates zoning in Washington Township). This subject is addressed on pages 71-72 of the narrative in the Application, which notes that the project area is in Morrow County's Agricultural Zoning District and that solar energy generation facilities up to 50 MW in capacity are a conditional use permitted in Washington Township. The County's Zoning Resolution, which addresses solar in Section 14 ("Solar Energy Systems Zoning") can be found at this link:*

https://cms9files.revize.com/morrowcooh/Zoning_Resolution_effective_2021_Redacted1pdf.pdf"

40. Provide a copy of the Morrow County Commissioner's unanimous resolution, mentioned on page 28 of this Application, in favor of the Applicant's QEP application and to enter a PILOT agreement.

***Response**: The resolution is provided at **Attachment 7**.*

Setbacks

41. On page 10 of the Application, the project wide setback is described as 250 feet from the project's fence and neighboring residence and on page 78 the setback is also described as the length of a football field. Please confirm what the Blossom Solar Project's setback will be.

***Response**: In all but a few instances, the Project's proposed fence line is located at least 300 feet (or the length of a football field) from neighboring residences. It many cases, the distance is much more than 300 feet. The minimum setback between the Project fence and any neighboring residence (that is, a residence that was in existence at the time the*

Application was submitted and is owned by a person not participating in the Project) will be 250 feet.

42. The Board seems to have proposed a setback on page 149 of 218 in its Entry dated June 16, 2022 in Docket No. 21-0902-GE-BRO that a solar facility design is to incorporate a minimum setback from the project's solar modules of at least 300 feet from non-participating residences existing as of the application filing date. Please confirm whether the Blossom Solar Project will meet or exceed this setback.

***Response**: Applicant believes that the 250-foot minimum setback discussed in the response to Question 42 is sufficient to minimize any impacts to neighboring homes from the Project. Initially, Applicant notes that the 250-foot minimum setback likely means that the closest neighboring home will be about 270 feet from the closest solar panels since the closest panels are likely to be built about 20 feet inside the fence to accommodate an interior, perimeter driving isle. Because the Project is benign and will cause minimal impacts to neighboring homes, setbacks between the Project and neighboring homes are needed only to minimize the Project's aesthetic impacts to adjacent residents. Applicant has proposed to address aesthetic impacts by a combination of significant setbacks and rigorous perimeter landscaping as proposed in the Preliminary Landscape Plan provided as Exhibit Z to the Application.*

Many of the neighboring homes, including some that could be between 250 feet and 300 feet of the fence, will be separated by substantial existing vegetative screening, making more robust setbacks wholly unnecessary. Under the Preliminary Landscape Plan, all of the neighboring homes, regardless of distance, will be separated by at least the additional screening to be planted during construction. Finally, Applicant notes that the owners of over a dozen neighboring homes (including some that may be between 250 and 300 feet of the Project's fence) have subscribed to Applicant's Home Solar Program under which the Project will make a payment sufficient to cover a significant portion of the subscriber's cost for a ground or roof-mounted solar installation.

43. The Board seems to have proposed a setback on page 149 of 218 in its Entry dated June 16, 2022 in Docket No. 21-0902-GE-BRO that a solar facility design is to incorporate a minimum setback from the project's solar modules of at least 150 feet from non-participating parcel boundaries. Please confirm whether the Blossom Solar Project will meet or exceed this setback.

***Response**: For several reasons, Applicant believes that its proposed minimum setback of 25-foot setback for non-participating parcel boundaries is sufficient. As noted in response to Question 42, the only reason for a setback for the Project is aesthetic and can be addressed through a combination of a minimum 250-foot home setback and robust perimeter landscaping. Applying a minimum setback to all properties of 150-feet will also waste land on field properties (no residences) because 150-foot-wide strips of land*

outside the Project's fence are unlikely to be farmed. If the Board were to adopt such a large setback for parcel lines through a condition, Applicant would hope that it (1) would be limited to parcels that contain homes; and (2) could be waived by written agreement with the neighbor.

44. On page 72 of the Application, Blossom Solar, LLC provides a link to Morrow County Zoning Resolution including Section 14 (Solar Energy Systems Zoning). Please list any setbacks pertaining to solar energy systems from that document and also indicate whether current proposed Blossom Solar Project meets or exceeds that setback.

***Response**: Applicant notes that local county zoning is not applicable to the Project pursuant to R.C. 4906.13. However, there are no setbacks listed pertaining to solar energy systems in Section 14 of the County Zoning Resolution. Additionally, the Project's proposed setbacks far exceed the applicable setbacks that apply to uses generally in the Agricultural Zoning District.*

Glare

45. Provide a glare analysis of the project.

***Response**: Applicant plans to submit a glare analysis to Staff by July 20, 2022.*

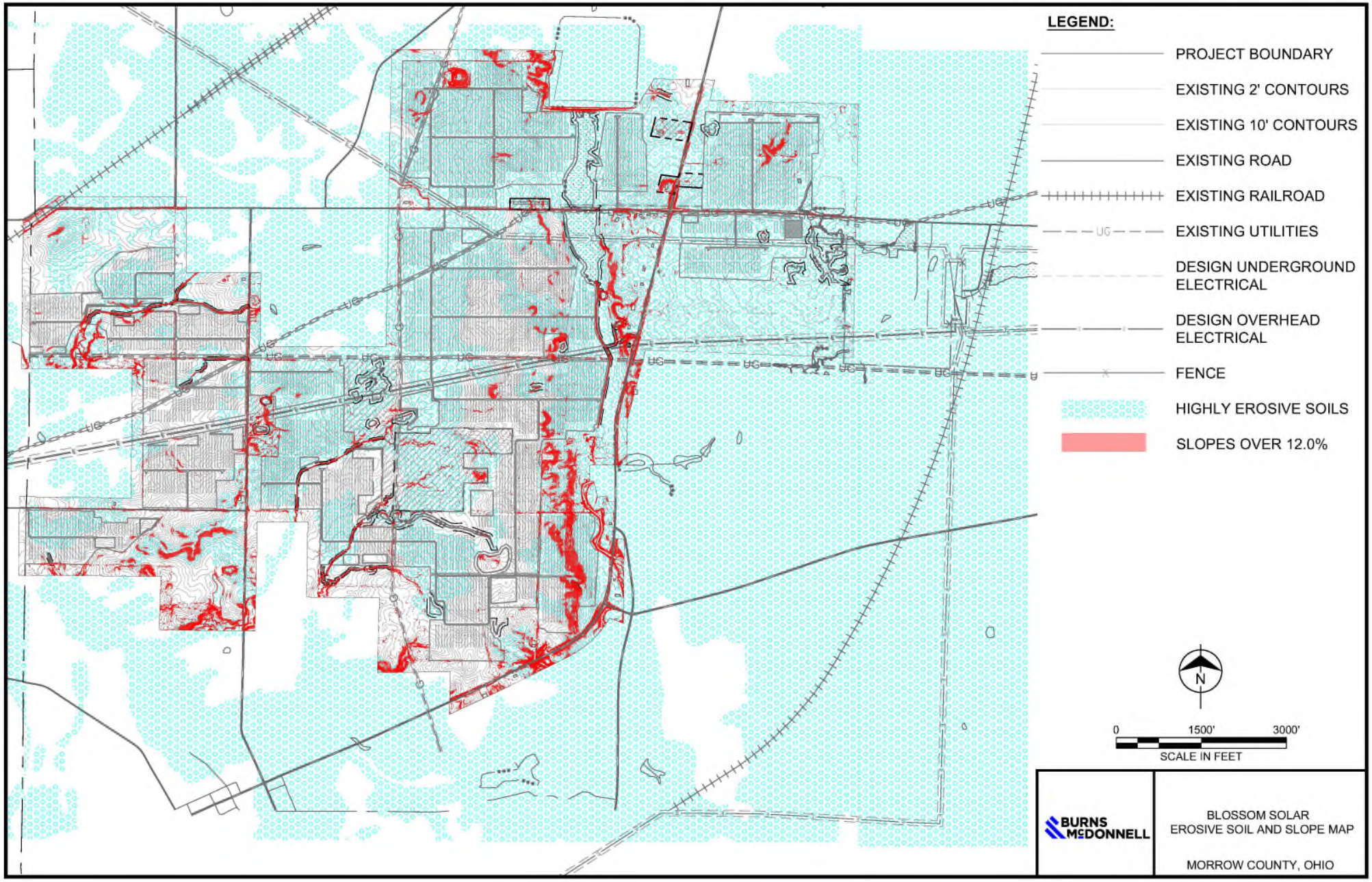
46. Will the solar panels selected for the project have an anti-reflective coating?

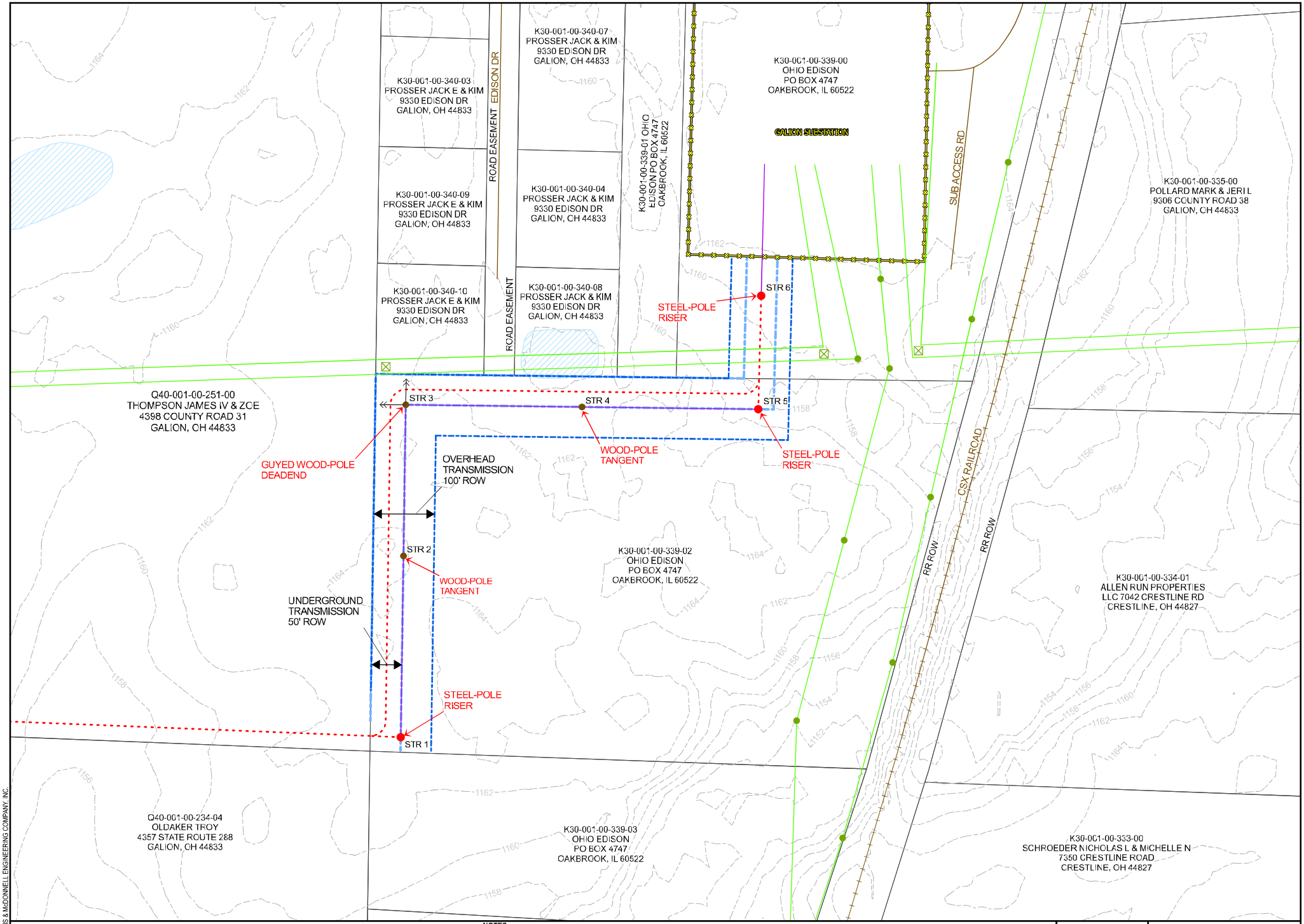
***Response**: Yes.*

Blossom Solar - Summary of Abandoned Oil & Gas Wells						
Well-ID	**Status**	**API**	**Plugged (Y/N)**	**Distance to Infrastucture (ft)**	**Within Site boundary (Y/N)**	**Link to Informaiton**
Manthey # 2	Not Drilled	34117236080000	N/A	100	Y	https://gis.ohiodnr.gov/mapviewer/WellSummaryCard.asp?api=34117236080000
Cliffshrire Estates 1	Not Drilled	34117222020000	N/A	3251	Y	https://gis.ohiodnr.gov/mapviewer/WellSummaryCard.asp?api=34117222020000
Glennhill MO & LJ 1-C	Not Drilled	34033200380000	N/A	4004	N	https://gis.ohiodnr.gov/mapviewer/WellSummaryCard.asp?api=34033200380000
Shifley # OK-38	Not Drilled	34117235830000	N/A	6758	N	https://gis.ohiodnr.gov/mapviewer/WellSummaryCard.asp?api=34117235830000
Hedges Unit # 2	Not Drilled	34117239360000	N/A	7459	N	https://gis.ohiodnr.gov/mapviewer/WellSummaryCard.asp?api=34117239360000
SIPES # 2	Not Drilled	34117240310000	N/A	4699	N	https://gis.ohiodnr.gov/mapviewer/WellSummaryCard.asp?api=34117240310000

Blossom Solar - Summary of Identified Water Wells						
Well-ID	**Status**	**Plugged (Y/N)**	**Distance to Infrastucture (ft)**	**Within Site Boundary (Y/N)**	**Use**	**Link to Information**
152818	Not Listed	Not Listed	386	Y	Domestic	https://waterwells.ohiodnr.gov/reports/well-log-report/152818
152819	Not Listed	Not Listed	562	Y	Domestic	https://waterwells.ohiodnr.gov/reports/well-log-report/152819
36130	Not Listed	Not Listed	350	Y	Domestic	https://waterwells.ohiodnr.gov/reports/well-log-report/36130
284842	Not Listed	Not Listed	600	Y	Domestic	https://waterwells.ohiodnr.gov/reports/well-log-report/284842
313082	Not Listed	Not Listed	520	Y	Domestic	https://waterwells.ohiodnr.gov/reports/well-log-report/313082
384009	Not Listed	Not Listed	1150	Y	Domestic	https://waterwells.ohiodnr.gov/reports/well-log-report/384009
4723595	Not Listed	Not Listed	562	Y	Not listed	Q40-001-00-200-03 - County Auditor Website, Morrow County, Ohio

ATTACHMENT 3





LEGEND

- PROPOSED WOOD-POLE
- PROPOSED GUYS
- PROPOSED STEEL-POLE RISER
- UNDERGROUND CENTERLINE
- OVERHEAD CENTERLINE
- UNDERGROUND RIGHT-OF-WAY
- OVERHEAD RIGHT-OF-WAY
- EXISTING POLE
- EXISTING TOWER
- EXISTING TRANSMISSION LINE
- SUBSTATION FENCE
- 2' CONTOURS
- PARCEL
- ROAD
- RAILROAD
- POND/LAKE

NOTES:

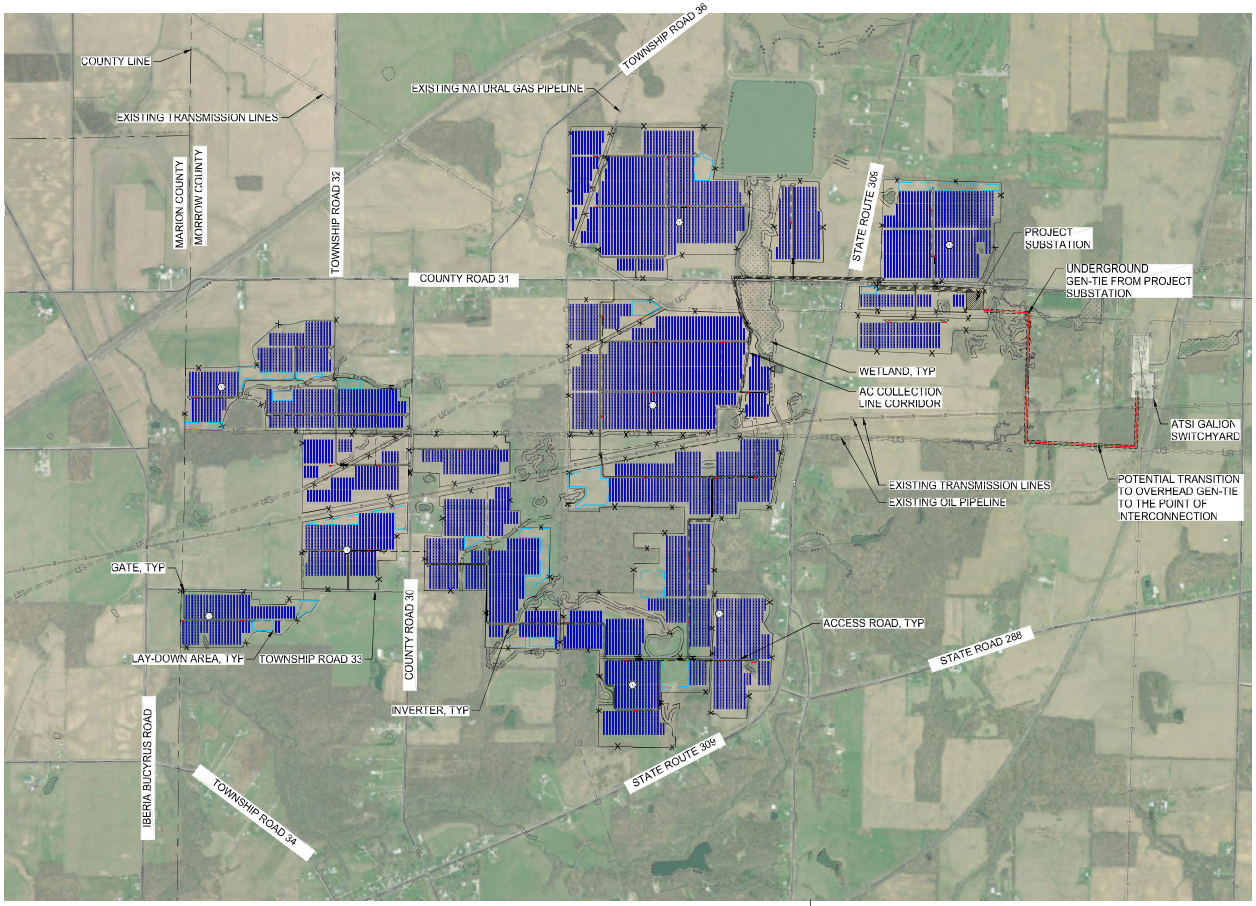
1. CONTOURS WERE GENERATED USING POWER LINE SYSTEMS (PLS) SOFTWARE WITH THE TERRAIN DATA BEING OBTAINED FROM OPEN SOURCED DATA SETS THROUGH PLS-CADD.
2. ALL EXISTING STRUCTURES & FACILITIES HAVE BEEN APPROXIMATED FROM AERIAL IMAGERY BY ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, & THE GIS USER COMMUNITY.
3. PARCEL INFORMATION WAS OBTAINED FROM MORROW COUNTY OHIO WEBSITE. HTTP://ENGINEER.CO.MORROW.OH.US/GISDATADOWNLOAD.ASPX.

0 50 100 200
Feet

N

BURNS McDONNELL

BLOSSOM SOLAR
SITE PLAN



GENERAL ARRANGEMENT
0 1000' 2000'
SCALE IN FEET

NORTH

LEGEND:

- PROPOSED FENCE
- ACCESS ROAD
- LAY-DOWN AREA
- WETLAND
- STREAM
- EXISTING TRANSMISSION/DISTRIBUTION LINE
- PROPOSED COLLECTION SYSTEM LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING OIL PIPELINE
- EXISTING NATURAL GAS PIPELINE
- INVERTER
- COUNTY LINE

SETBACKS	
PROPERTY LINE TO FENCELINE	25' MIN.
NEIGHBORING RESIDENCE TO FENCELINE	250' MIN.
JURISDICTIONAL WATERWAY OR WETLAND TO FENCELINE	25' MIN.
EXISTING ROAD R-O-W TO FENCELINE	25' MIN.
NEIGHBORING RESIDENCES TO INVERTERS	500' MIN.

SYSTEM DESCRIPTION (SITE TOTAL)	
POI CAPACITY (AC)	144.0 MW
INVERTER NAMEPLATE CAPACITY	160.0 MW
SOLAR CAPACITY (DC)	159.5 MW
DC:AC RATIO (@ POI)	1.11
AC COLLECTION SYSTEM VOLTAGE	34.5 kV
DC SYSTEM VOLTAGE	1,500 V
TOTAL MODULES	295,360
MODULES PER STRING	26
AVERAGE STRINGS PER INVERTER	284
TOTAL INVERTER SKIDS	40

DESIGN PARAMETERS	
GROUND COVER RATIO	31%
RACKING	SINGLE AXIS TRACKER
ROW TO ROW SPACING	50.98'
NO. OF 4-STRING TRACKERS	2,840

MODULE PARAMETERS	
MANUFACTURER	LONGI
MODEL NUMBER	LR5-72HPH-540M BIFACIAL
MODULE WATTAGE	540 W

PV INVERTER PARAMETERS	
MANUFACTURER	SMA
MODEL NUMBER	SUNNY CENTRAL 4000 UP-US
INVERTER NAMEPLATE RATING	4,000 kVA

NOTES:

1. THIS DRAWING IS CONCEPTUAL IN NATURE AND FOR PLANNING PURPOSES ONLY.
2. THIS DRAWING REPRESENTS ONE PROPOSED LAYOUT AND IS SUBJECT TO CHANGE BASED ON DETAILED DESIGN, AS WELL AS ACTUAL SITE CONDITIONS.
3. SITE TO INCLUDE 16' ACCESS ROADS.
4. TURNING RADIUS ON ROADS TO BE 35' TYPICAL.

KEYED NOTES:

1. SOLAR MEASUREMENT STATION

FOR PERMITTING PURPOSES ONLY

no.	date	by	ckd	description
1	07/2022	PSD	-	ISSUED FOR PERMIT
0	05/2022	PSD	-	ISSUED FOR PERMIT

BURNS McDONNELL
530 W. SPRING ST., SUITE 200
COLUMBUS, OH 43215
614-453-7800
Burns & McDonnell Engineering Co, Inc.

designed P. DURKEE | detailed D. KOPER

MORROW COUNTY, OH

BLOSSOM SOLAR PROJECT
OVERALL GENERAL ARRANGEMENT

project 132219 | contract -
drawing CS100 | rev. 1
sheet - of - sheets
file 132219CS100.dwg

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Hillcrest Solar

Emergency Response Plan

June 1st 2019	Rev 0
Created By	Approved By
Fatima Babiker	David Kline
OHS Coordinator – Western Canada & U.S.A	Senior Manager- Project & Business Development

INNERGEX
Renewable Energy
Sustainable Development

Table Of Contents

INNERGEX
Renewable Energy
Sustainable Development

1.0 INTRODUCTION

The 200MW$_{AC}$ Hillcrest Solar project ("Hillcrest" or the "Project") is a utility-scale solar development project in Ohio, located 30 miles east of Cincinnati in Brown County. The Project will interconnect to the existing Duke Energy 138/345 kV Hillcrest substation located at the intersection of Greenbush Road and Driver Collins Road. Development of the Project is significantly advanced, with the following key items completed:

- Site control and interconnection rights-of-way 100% secured.
- All environmental surveys completed.
- Interconnection services agreement fully executed.
- Ohio State Power Siting Board ("**OPSB**") certificate obtained.
- Ohio Development Services Agency ("**ODSA**") tax abatement certificate received.

Hillcrest is scheduled to begin full construction in Q1 2020 and commence commercial operations during Q4 2020.

2.0 PURPOSE

This Emergency Response Plan ("ERP") is written as a guideline for Hillcrest and Brown County emergency services to agree on a planned response to emergency situations as may occur on site from time to time during the normal course of operation.

Additionally, the ERP is intended to comply with both Ohio Revised Code (ORC) 5727.75v1 (F)(5) to *"Provide or facilitate training for fire and emergency responders for response to emergency situations related to the energy project and, for energy projects with a nameplate capacity of five megawatts or greater, at the person's expense, equip the fire and emergency responders with proper equipment as reasonably required to enable them to respond to such emergency situations"* as well as the OPSB permit requirement that *"prior to the start of construction of the Project, Applicant will develop an emergency response plan that will including plans for fire and ambulance, in consultation with potentially affected local officials and emergency personnel. These will include the Brown County Engineer, the Brown County Sherriff's Department, the Township Officials of Green Township, the Mt. Orab Fire Department, the Mt. Orab Medical Center, and local ambulance services. The emergency response plan will include information on the location of the different components of the Project, the potential hazards presented (including potential hazards to emergency responders), the locations of access gates for the Solar Fields and the Project Substation, and appropriate (24/7) contact information."*

The ERP provides guidance on:

- Communications
- Resources and Assets
- Safety and Security
- Staff Responsibilities
- Utilities Management

3.0 DEFINITIONS

a. **Evacuation:** Is a controlled egress of all persons including contractors and visitors from the site. In cases of evacuation it is assumed that Hillcrest's Operations and Maintenance ("O&M") staff will be available to coordinate the evacuation operation.

b. **Escape:** Is when egress from the site must be undertaken in a rapid timeframe to avoid a major hazard. In cases of escape it is assumed that the Hillcrest site will be immediately vacated and staff will not available to coordinate ongoing operations. It is envisaged that this level of response could be necessary if an immediate life threating situation exists; e.g. wildfire at or near the Hillcrest O&M building.

c. **Rescue:** Is the recovery of persons after they have Escaped from a hazardous situation or environment. This document assumes that persons can drive off site to a place of safety (muster point) and will not need to be rescued.

Escalation will normally be initiated via a 911 call to emergency services.

Emergency plant shutdown procedures should be implemented prior to site evacuation only if facilities are threatened. This would involve de-energizing Hillcrest's main power transformer, followed by the inverters. A further request to Duke Energy to de-energize the Project's 138kV transmission line may be required depending on severity and location of the emergency event.

The information and visitor log shall be used to account for persons during roll call.

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4.0 RESPONSIBILITIES

a. The Regional Operations Manager ("ROM"), or designee, has overall responsibility for the development, revision and implementation of emergency plans and for assigning the title and associated responsibilities of Emergency Coordinator ("EC") to an employee to adequately cover all periods when the facility is occupied.
b. The ROM is responsible for execution of these plans.
c. The ROM is responsible for annual drills; ensuring all outside organizations are notified, if necessary, and coordinating a response to the incident as well as directing the evacuation according to this plan.
d. The ROM shall designate an EC if the emergency requires personnel to evacuate.
e. In the absence of the ROM, the Operations Manager ("OM") will act as the ROM until further notice and shall account for all O&M personnel on-site. Sign-in sheet will be required for all staff, contractors and visitors to site.
f. The EC shall maintain radio communication with the ROM and keep a head count of all evacuated, site and contract personnel in order to report status to the ROM. The EC may be any qualified site employee.
g. All personnel will be trained regarding fire routes, exits, storm shelters, the location and use of emergency equipment, and understanding and following these plans. All personnel who have contractors or visitors at the site shall ensure that they are familiar with these plans.

5.0 REFERENCES

Hillcrest must also show compliance with applicable Ohio Fire Code (Administrative Code [OAC]) OAC 1301: 7-7-04 Emergency Planning and Preparedness and other standards to which the organization subscribes. As such, Hillcrest will also employ the Innergex Emergency Response Plan Procedure, as detailed in Section 8, which outlines expectations and response for an effective emergency response plan for emergencies on site.

6.0 HAZARDS

During the development and operation of Hillcrest, the exposure to potential emergencies such as fire, natural disasters, injury and incident may occur. This ERP is tailored using area-specific hazards and risk assessments. Local response requirements are planned to determine the training and equipment needed for local state emergency response services.

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7.0 PREPAREDNESS

The ERP will be managed and maintained by the Innergex Health and Safety Department and Hillcrest O&M staff to ensure the correct implementation of the ERP should an emergency occur. During this phase, Hillcrest will develop plans and operational capabilities to improve the effectiveness of the site's response to emergencies. Duties of the O&M staff will include:

- Develop / update emergency plans and procedures, including the ERP
- Train emergency response personnel.
- Conduct drills and exercises.

8.0 PROCEDURE

8.1 Site Evacuation

The decision to evacuate site will be taken by the OM or ROM following consultation with O&M staff on site. Circumstances giving rise to evacuation of site include but are not limited to:

- A situation which has the capacity to threaten the integrity of the O&M building and the safety of persons inside within a defined timeframe.
- Advice to evacuate from another authority: e.g. Brown County Sherriff's Dept. or Mt. Orab Fire Dept.

The OM, with the assistance of O&M staff on site will:

a) Initiate the evacuation procedure by reporting an emergency via VHF radio (emergency channel) and request all persons to report to the muster area for roll call.
NOTE: Depending on circumstances the muster location for roll call will be determined by the OM and is likely to be outside the main gates of the plant.

b) If required, implement emergency plant shutdown procedures.

c) Identify the safest evacuation route and method. This will include:
- Identification of a muster point near the Project
- Identification of transport requirements from Project to the muster point.
- Onward transportation requirements (if required).
- Identification of GPS co-ordinates for the identified muster point.

d) Request assistance for evacuation transportation if persons are injured.

NOTE: this will normally be via 911.

- Provide details of injured persons to be evacuated (number and severity of injury).

e) Perform a roll call of all persons expected to be at the muster point.
   - Photograph and take visitor logs for the day to be used to identify persons on site.

f) Handle casualties and communicate with emergency services as indicated in the following relevant sections.

8.2 Life Threatening Scenarios/Injuries

The decision to escape from the Hillcrest solar O&M building will be taken by the OM following consultation with the O&M Site Manager (or in his absence the site lead technician) on the advice of information immediately available. Circumstances giving rise to escape from the Hillcrest Solar O&M building would be:

- An immediate life-threatening situation to the O&M building or solar equipment from a natural disaster event or catastrophic failure of plant.

The OM with the assistance of the O&M staff on site will:

a) Assess the emergency and identify a place of safety (muster point) outside the gates of the solar farm.
b) Initiate the escape procedure by reporting an emergency via VHF radio (emergency channel) and request all persons to report to the muster point.
c) If required initiate emergency plant shutdown procedures.
d) Proceed to the muster point with a photograph of the daily site activity board and the daily visitor log.
e) Perform a roll call of all person(s) expected to be at the muster point.
f) Request assistance for evacuation transportation if persons are injured.

   NOTE: this will normally be via 911.

   - Provide details of injured persons who will need to be evacuated (number and severity of injury).

g) Handle casualties and communicate with emergency services as indicated in the following relevant sections.

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8.3 Exercise and Training

Hillcrest will carry out site evacuation response drills on an annual basis, including confirmation of all emergency supplies in coordination with the all external departments involved with the execution of this ERP.

8.4 Emergency Communication Strategies

In the case of an emergency, Hillcrest provides the following means of emergency communication:

- **Cellular Phones/Texting:** Staff personal cell phones will be used as available to communicate externally if hard wired phone systems are not operable.

- **Land Line Phones:** These phones are hard-wired into Hillcrest O&M building and are used for internal and external communications.

- **Two-way Radios:** These radios are used internally and externally with O&M staff for every-day communications. These radios will be a means of communication to report any emergency service personnel such as the Fire Dept, County Sheriff, etc.

- **RockStar GPS:** All field personnel are equipped with a Rockstar GPS device. Any of these devices can be used to contact both fellow field personnel or operation managers. These devices can also send alerts that are received by a local call center and the manager/coordinator. Most are capable of Bluetooth connection to enable text/email messaging through a smartphone

9.0 REPORTING

All medical emergencies shall immediately be reported to the ROM and Director of Operations as follows:

Attention: Tony Nott - Director of Operations
Phone: 778-877-0475
Email: Tnott@innergex.com

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Renewable Energy
Sustainable Development

Attention: Matt Allsup – Regional Operations Manager
Phone: 778-877-0475
Email: Mallsup@innergex.com

As per all medical emergencies, a complete accident investigation form will be completed within 2 days of the incident.

10.0 ALL CLEAR

The OM shall consult with Emergency Services before announcing an all clear which would signal that persons can return to the Hillcrest Solar O&M building.

11.0 EMERGENCY CONTACT LIST

Contact Name	Emergency line	Non-emergency Line
Brown County Sherriff's Department	911	920-391-7450
Mt. Orab Fire Department	911	937-444-2379
Mt. Orab Medical Center	911	937-444-4000
Mt. Orab EMS	911	937-444-3945
Township Officials of Green Township	N/A	419-938-8832
Brown Country Engineering Department	N/A	937-378-6456
Ohio 24-hour emergency spill hotline	N/A	1-800-282-9378
Innergex Vancouver Office	N/A	604-633-9990

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12.0 LOCATION

Hillcrest is located 30 miles east of Cincinnati in Mount Orab, Brown County, Ohio.
Latitude: 39.076972° Longitude: -83.906046°

RESOLUTION NO. 22R-149

2-16, 2022

IN THE MATTER OF APPROVING A QUALIFIED ENERGY PROJECT EXEMPTION APPLICATION SUBMITTED BY BLOSSOM SOLAR, LLC FOR THE BLOSSOM SOLAR PROJECT IN MORROW COUNTY AND THEREBY EXEMPTING SUCH PROPERTY IN THE COUNTY FROM REAL AND PERSONAL PROPERTY TAXATION; REQUIRING ANNUAL SERVICE PAYMENTS IN LIEU OF TAXES; AND SPECIFYING THE TIME AND MANNER OF SUCH PAYMENTS

This day the Board of Morrow County Commissioners met in regular session, with the following members present: Thomas Whiston, Tim Siegfried, and Tim Abraham.

It was moved by Commissioner Abraham and seconded by Commissioner Whiston that the following be adopted.

WHEREAS, Ohio Revised Code ("R.C.") Section 5727.75 allows a "qualified energy project" using renewable energy resources to be exempt from real property taxes and tangible personal property taxes if certain conditions are satisfied (a "Qualified Energy Project"); and

WHERAS, a Qualified Energy Project may be certified by the Director of the Ohio Department of Development ("ODOD") in accordance with the provisions of R.C. Section 5727.75 and the Ohio Administrative Code Chapter 122:23-1; and

WHEREAS, Blossom Solar, LLC (the "Company") desires to construct a new 144 megawatt nameplate capacity solar energy facility, on multiple parcels of land located within Washington Township, Morrow County, Ohio, and which may include, depending on development decisions, certain additional parcels of land in Tully Township, Marion County, Ohio (the "Project"); and

WHEREAS, the Company submitted an Ohio Qualified Energy Project Tax Exemption Program Application for Certification to the Director of ODOD on January 20, 2022 (the "Application"), a copy of which is attached hereto as Exhibit A and incorporated herein by reference; and

WHEREAS, the Application requests certification of the Project as a qualified energy project under R.C. Section 5727.75 for that portion of the Project located in Morrow County, Ohio (the "County"); and

WHEREAS, this Board of Morrow County Commissioners (the "Board") has received and reviewed the Application submitted by the Company to ODOD for the Project; and

WHEREAS, the Project is expected to be an important source of renewable energy in the County, and the Board believes that that the Project will benefit the citizens of the County and serve as a model alternative energy project for future development; and

WHEREAS, pursuant to R.C. Section 5727.75(E)(1)(b), the Board must adopt a resolution approving or rejecting the Company's Application; and

WHEREAS, the Board may require an annual service payment to be made in addition to the service payment required under R.C. Section 5727.75(G), provided the sum of the service payment required in the resolution and the service payment required under R.C. Section 5727.75(G) shall not exceed $9,000 per megawatt of nameplate capacity located in the County and the resolution specifies the time and manner in which the payments required by the resolution shall be paid to the County's Treasurer; and

WHEREAS, the Board desires to encourage the construction and development of alternative energy projects in the County.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS FOR MORROW COUNTY, OHIO THAT:

SECTION 1. This Board hereby approves the Application pursuant to R.C. Section 5727.75(E)(1)(b).

SECTION 2. The approval provided in Section 1 of this resolution is expressly conditioned upon the payment of an annual service payment required under R.C. Section 5727.75(G) in the amount of seven thousand dollars per megawatt of nameplate capacity located in the County. The annual service payment in lieu of taxes shall be charged, collected, and distributed at the same time and in the same manner as the taxes that would ordinarily be imposed on taxable property.

SECTION 3. The approval provided in Section 1 of this resolution is also expressly conditioned upon the payment of an additional annual service payment to the County as permitted under R.C. Section 5727(E)(1)(b) in the amount of two thousand dollars per megawatt of nameplate capacity located in the County. The payment of this additional annual service payment shall be charged and collected at the same time, in the same manner and under the same conditions as set forth in Section 2. The additional annual service payment set forth in this Section shall be deposited into the County general fund in accordance with R.C. Section 5727.75(E)(1)(b).

SECTION 4. The sum of the annual service payments set forth in Sections 2 and 3 of this resolution shall equal, and may not exceed in any year, nine thousand dollars per megawatt of nameplate capacity located in the County, pursuant to R.C. Section 5727(E)(1)(b).

SECTION 5. The clerk of this Board is hereby directed to send a copy of this resolution by certified mail to the Director of ODOD and to the Company within thirty (30) days after receipt of the Application.

SECTION 6. The Board finds and determines that all formal actions of this Board and any of its committees concerning and related to the adoption of this resolution, and that all deliberations of this Board and of any of its committees that resulted in those formal actions were taken or held in meetings open to the public and in compliance with Ohio law, including R.C. Section 121.22.

SECTION 7. This resolution shall take effect and be in force from and after the earliest period allowed by law.

Roll call resulted as follows:

YES/NO
Thomas Whiston

YES/NO
Tim Siegfried

YES/NO
Tim Abraham

Date Adopted: February 16, 2022

Approved as to form:

Thomas Smith, County Prosecutor

CERTIFICATION

The undersigned Clerk of the Board of County Commissioners hereby certifies that the foregoing is a true and correct copy of Resolution No 22-R-149 adopted by the Board of County Commissioners of Morrow County, on February 16, 2022.

Cheryl Heacock

BCC, Clerk
Cheryl Heacock

Ohio Qualified Energy Project Tax Exemption Program Application for Certification

Ohio | Development Services Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor

Lydia L. Mihalik, Director

Instructions: This application is to be completed by an owner or lessee pursuant to a sale and leaseback transaction of an energy project which seeks to obtain certification as a Qualified Energy Project under Ohio Revised Code (ORC) section 5727.75 and Ohio Administrative Code sections 122:23-1-01 through 122:23-1-10. This application should only be submitted for energy projects (1) whose alternating current nameplate capacity exceeds 250 kilowatts, and (2) the electricity generated will be supplied to a third party or is subject to a net metering agreement.

If you have any questions about this application, please contact John Werkman, Assistant Chief, Business Services Division:

(614) 466-6791 | John.Werkman@development.ohio.gov

A complete application (including all required attachments) will be considered received when delivered to the following address:

Ohio Development Services Agency
Office of Strategic Business Investments
Attn: John Werkman, 28th Floor
77 S. High St.
Columbus, OH 43215

PART I: Applicant Information

Type of Applicant: ☑ Owner ☐ Lessee

Applicant Legal Name: Blossom Solar, LLC

Applicant Address: 1105 Navasota St.

Applicant City, State, Zip: Austin, TX 78702

Applicant FEIN: 84-4783410

Applicant State of Incorporation: Delaware

Ohio Secretary of State Registration Number: 4438814

Applicant Contact Name: Patrick Buckley

Applicant Contact Address: 1105 Navasota St.

Applicant Contact City, State, Zip: Austin, TX 78702

Applicant Contact Phone: (512) 524-1195

Applicant Contact Email: patrick@openroadrenewables.com

PART II: Project Information

Type of Energy Resource: (Check one)

☑ Renewable Energy – Solar ☐ Renewable Energy – Wind

☐ Renewable Energy – Other (please describe) _____

Estimated Construction Start Date: July 1, 2023

Estimated Construction Completion Date: Dec. 31, 2024

Project Description:

Blossom Solar, LLC is a proposed solar photo-voltaic facility located in Morrow County, southwest of Galion, OH. Blossom will consist of solar modules affixed to single-axis tracking or fixed-tilt racking that is mounted on support pilings. The direct current (DC) electricity generated when the sun strikes the modules feeds to central inverters, which step up the voltage and change the electricity from DC to AC. Underground 34.5 kV cables transport the AC electricity to Blossom's substation consisting of transformers and switchgear, which connects to First Energy's existing 138kV Galion switchyard. Other project infrastructure includes security fencing, gravel access roads, solar measurement equipment and a control room.

Attachment A - Real Property Listing

Parcel Number	Owner of Record	Mailing Address	Property Address	County	Township	Acreage for Improvements	Real Property Used Exclusively for Power Production	Solar Infrastructure
Q40-001-00-200-00	Cole, Sharon E. and James T.	720 Hess Street Galion, OH 44833	3863 RT 309 ST Galion, OH 44833	Morrow	Washington	8.61	8.61	Solar Array
Q40-001-00-200-02	Cole, Sharon E. and James T.	720 Hess Street Galion, OH 44833	RT 309 REAR ST Galion, OH 44833	Morrow	Washington	100.00	85.50	Solar Array
Q40-001-00-200-03	Cole, Sharon E. and James T.	720 Hess Street Galion, OH 44833	RT 309 ST Galion, OH 44833	Morrow	Washington	44.42	44.42	Solar Array
Q40-001-00-207-00	Cole, Sharon E. and James T.	720 Hess Street Galion, OH 44833	RT 309 ST Galion, OH 44833	Morrow	Washington	57.20	57.20	Solar Array
Q40-001-00-239-00	Cole, Sharon E. and James T.		4221 RT 309 ST Galion, OH 44833	Morrow	Washington	103.57	89.67	Solar Array
Q40-001-00-239-02	Cole, Sharon E. and James T.	720 Hess Street Galion, OH 44833	RT 309 REAR ST Galion, OH 44833	Morrow	Washington	45.00	39.50	Solar Array
Q40-001-00-239-03	Cole, Sharon E. and James T.	720 Hess Street Galion, OH 44833	RT 309 REAR ST Galion, OH 44833	Morrow	Washington	56.87	30.12	Solar Array
Q40-001-00-287-02	Kincaid: David A. and Karen L. Kincaid and Nathan A. and Leanette L. Kincaid	David and Karen Kincaid 9095 County Road 30 Galion, OH 44833 Nathan and Leanette Kincaid 8376 County Road 30 Galion, OH 44833	9095 CO 30 RD Galion, OH 44833	Morrow	Washington	40.02	40.02	Solar Array
Q40-001-00-289-00	Kincaid: David A. and Karen L. Kincaid and Nathan A. and Leanette L. Kincaid	David and Karen Kincaid 9095 County Road 30 Galion, OH 44833 Nathan and Leanette Kincaid 8376 County Road 30 Galion, OH 44833	9095 CO 30 RD Galion, OH 44833	Morrow	Washington	199.98	134.18	Solar Array
Q40-001-00-293-00	Layman, Larry E. and Arlene M.	8916 County Rd 30 Galion, OH 44833	CO 30 RD Galion, OH 44833	Morrow	Washington	78.55	74.78	Solar Array
Q40-001-00-293-02	Layman, Larry E. and Arlene M.	8916 County Rd 30 Galion, OH 44833	TWP 33 RD Galion, OH 44833	Morrow	Washington	32.53	32.53	Solar Array
Q40-001-00-296-00	Layman, Larry E. and Arlene M.	8916 County Rd 30 Galion, OH 44833	TWP 33 RD Galion, OH 44833	Morrow	Washington	57.00	57.00	Solar Array
Q40-001-00-276-00	Loyer, Clark G.	4000 County Rd 31 Galion, OH 44833	3666 CO 31 RD Galion, OH 44833	Morrow	Washington	160.00	160.00	Solar Array
Q40-001-00-276-01	Loyer, Clark G.	4000 County Rd 31 Galion, OH 44833	CO 31 RD Galion, OH 44833	Morrow	Washington	74.97	74.97	Solar Array
Q40-001-00-248-00	Miley, Craig A. and Marilyn	703 Harding Way West Galion, OH 44833	RT 309 ST Galion, OH 44833	Morrow	Washington	82.63	82.63	Solar Array
Q40-001-00-248-02	Miley, Craig A. and Marilyn	703 Harding Way West Galion, OH 44833	4450 RT 309 ST Galion, OH 44833	Morrow	Washington	1.96	1.96	Solar Array
Q40-001-00-248-01	Miley, Craig A. and Marilyn	703 Harding Way West Galion, OH 44833	TWP 31 RD S Galion, OH 44833	Morrow	Washington	1.00	1.00	Solar Array
Q40-001-00-249-02	Moyer, Jon D. & Tanya S.	4304 County Rd, 31 Galion, OH 44833	4304 County Rd. 31 Galion, OH 44833	Morrow	Washington	28.00	28.00	Buried Collection Line
K30-001-00-339-02	Ohio Edison	PO BOX 4747 Oakbrook, IL 60522	4610 TWP 31 RD Galion, OH 44833	Morrow	North Bloomfield	13.10	13.10	Overhead Collection Line
K30-001-00-339-00	Ohio Edison	PO BOX 4747 Oakbrook, IL 60522	4550 TWP 31 RD Galion, OH 44833	Morrow	North Bloomfield	31.70	31.70	Overhead Collection Line
Q40-001-00-255-00	Pfeilderer, Ethan A. & Adamlee A.	5070 County Road 57 Galion, OH 44833	RT 309 ST Galion, OH 44833	Morrow	Washington	107.71	102.39	Solar Array
Q40-001-00-255-01	Pfeilderer, Ethan A. & Adamlee A.	5070 County Road 57 Galion, OH 44833	4620 RT 309 ST Galion, OH 44833	Morrow	Washington	10.79	10.79	Solar Array
Q40-001-00-299-00	Rafferty, Darlene D.	3378 County Road 31 Galion, OH 44833	3378 CO 31 RD Galion, OH 44833	Morrow	Washington	152.00	70.93	Solar Array
Q40-001-00-256-00	Rosy Uppal Farm, LLC	34 Dora Lane Holmdel, NJ 07733	RT 309 ST Galion, OH 44833	Morrow	Washington	40.29	40.29	Solar Array
Q40-001-00-275-00	Rosy Uppal Farm, LLC	34 Dora Lane Holmdel, NJ 07733	3871 CO 31 RD Galion, OH 44833	Morrow	Washington	73.96	73.96	Solar Array
Q40-001-00-275-01	Rosy Uppal Farm, LLC	34 Dora Lane Holmdel, NJ 07733	CR 31 RD Galion, OH 44833	Morrow	Washington	73.78	73.78	Solar Array
Q40-001-00-275-02	Rosy Uppal Farm, LLC	34 Dora Lane Holmdel, NJ 07733	CR 31 RD Galion, OH 44833	Morrow	Washington	51.68	51.68	Solar Array
Q40-001-00-251-00	Thompson, James L. III and Anna	4398 CR 31 Galion, OH 44833	4398 TWP 31 RD Galion, OH 44833	Morrow	Washington	40.00	40.00	Buried Collection Line

Attachment C - Licenses, Permits and Approvals

Name of License, Permit or Approval	Granting Authority	Status	Application/Issuance Date	Expiration Date	Renewal Required
Certificate of Environmental Compatibility and Public Need	OPSB	Not Complete	N/A	N/A	N/A
Construction Stormwater Permit - NPDES	OEPA	Not Complete	N/A	N/A	N/A
Right-of-Way Use Permit(s) (as necessary)	ODOT	Not Complete	N/A	N/A	N/A
Driveway Permit(s) (as required)	ODOT/Morrow County	Not Complete	N/A	N/A	N/A
Road Use & Maintenance Agreement	County/Township	Not Complete	N/A	N/A	N/A
Water Protection Permits (Section 404/401)	Ohio EPA/USACE	Not Complete	N/A	N/A	N/A
Notice of Approval of Power Generating Company	PUCO	Not Complete	N/A	N/A	N/A
Renewable Energy Resource Facility Certification	PUCO	Not Complete	N/A	N/A	N/A
Heavy Loads/Wide Loads Permit	Morrow County Engineers	Not Complete	N/A	N/A	N/A
Special Hauling Permits (as necessary)	ODOT	Not Complete	N/A	N/A	N/A
Road Crossing Permits (as necessary)	ODOT or County Engineers	Not Complete	N/A	N/A	N/A
Spill Prevention Control and Countermeasures Plan	USEPA	Not Complete	N/A	N/A	N/A

MORROW COUNTY COMMISSIONERS

80 North Walnut Street, Suite A
Mount Gilead, Ohio 43338

Commissioners:
Thomas E. Whiston
Timothy D. Abraham
Timothy R. Siegfried

Phone: (419) 947-4085
Fax: (419) 947-1860
www.morrowcountyohio.gov

The following action was taken by the Board of Morrow County Commissioners during regular session on February 16, 2022:

IN THE MATTER OF
APPROVING A QUALIFIED ENERGY PROJECT EXEMPTION APPLICATION SUBMITTED BY BLOSSOM SOLAR, LLC FOR THE BLOSSOM SOLAR PROJECT IN MORROW COUNTY AND THEREBY EXEMPTING SUCH PROPERTY IN THE COUNTY FROM REAL AND PERSONAL PROPERTY TAXATION; REQUIRING ANNUAL SERVICE PAYMENTS IN LIEU OF TAXES; AND SPECIFYING THE TIME ANND MANNER OF SUCH PAYMENTS: 22-R-149

This day the Board of Morrow County Commissioners met in regular session, with the following members present: Thomas Whiston, Tim Siegfried and Tim Abraham.

It was moved by Commissioner Abraham and seconded by Commissioner Whiston that the following be adopted.

WHEREAS, Ohio Revised Code ("R.C.") Section 5727.75 allows a "qualified energy project" using renewable energy resources to be exempt from real property taxes and tangible personal property taxes if certain conditions are satisfied (a "Qualified Energy Project"); and

WHEREAS, a Qualified Energy Project may be certified by the Director of the Ohio Department of Development ("ODOD") in accordance with the provisions of R.C. Section 5727.75 and the Ohio Administrative Code Chapter 122:23-1; and

WHEREAS, Blossom Solar, LLC (the "Company") desires to construct a new 144 megawatt nameplate capacity solar energy facility, on multiple parcels of land located within Washington Township, Morrow County, Ohio, and which may include, depending on development decisions, certain additional parcels of land in Tully Township, Marion County, Ohio (the "Project"); and

WHEREAS, the Company submitted an Ohio Qualified Energy Project Tax Exemption Program Application for Certification to the Director of ODOD on January 20, 2022 (the "Application"), a copy of which is attached hereto as Exhibit A and incorporated herein by reference; and

WHEREAS, the Application requests certification of the Project as a qualified energy project under R.C. Section 5727.75 for that portion of the Project located in Morrow County, Ohio (the "County"); and

WHEREAS, this Board of Morrow County Commissioners (the "Board") has received and reviewed the Application submitted by the Company to ODOD for the Project; and

WHEREAS, the Project is expected to be an important source of renewable energy in the County,

and the Board believes that the Project will benefit the citizens of the County and serve as a model alternative energy project for future development; and

WHEREAS, pursuant to R.C. Section 5727.75(E)(1)(b), the Board must adopt a resolution approving or rejecting the Company's Application; and

WHEREAS, the Board may require an annual service payment to be made in addition to the service payment required under R.C. Section 5727.75(G), provided the sum of the service payment required in the resolution and the service payment required under R.C. Section 5727.75(G) shall not exceed $9,000 per megawatt of nameplate capacity located in the County and the resolution specifies the time and manner in which the payments required by the resolution shall be paid to the County's Treasurer; and

WHEREAS, the Board desires to encourage the construction and development of alternative energy projects in the County.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS FOR MORROW COUNTY, OHIO THAT:

SECTION 1. This Board hereby approves the Application pursuant to R.C. Section 5727.75(E)(1)(b).

SECTION 2. The approval provided in Section 1 of this resolution is expressly conditioned upon the payment of an annual service payment required under R.C. Section 5727.75(G) in the amount of seven thousand dollars per megawatt of nameplate capacity located in the County. The annual service payment in lieu of taxes shall be charged, collected, and distributed at the same time and in the same manner as the taxes that would ordinarily be imposed on taxable property.

SECTION 3. The approval provided in Section 1 of this resolution is also expressly conditioned upon the payment of an additional annual service payment to the County as permitted under R.C. Section 5727(E)(1)(b) in the amount of two thousand dollars per megawatt of nameplate capacity located in the County. The payment of this additional annual service payment shall be charged and collected at the same time, in the same manner and under the same conditions as set forth in Section 2. The additional annual service payment set forth in this Section shall be deposited into the County general fund in accordance with R.C. Section 5727.75(E)(1)(b).

SECTION 4. The sum of the annual service payments set forth in Sections 2 and 3 of this resolution shall equal, and may not exceed in any year, nine thousand dollars per megawatt of nameplate capacity located in the County, pursuant to R.C. Section 5727(E)(1)(b).

SECTION 5. The clerk of this Board is hereby directed to send a copy of this resolution by certified mail to the Director of ODOD and to the Company within thirty (30) days after receipt of the Application.

SECTION 6. The Board finds and determines that all formal actions of this Board and any of its committees concerning and related to the adoption of this resolution, and that all deliberations of this Board and of any of its committees that resulted in those formal actions were taken or held in meetings open to the public and in compliance with Ohio law, including R.C. Section 121.22.

SECTION 7. This resolution shall take effect and be in force from and after the earliest period allowed by law.

s/Thomas Whiston
s/Tim Siegfried
s/Tim Abraham

Adopted February 16, 2022

Approved as to form: s/Thomas Smith, County Prosecutor

Certification: s/Cheryl S. Heacock, Clerk

Roll Call Vote: ..,Mr. Whiston…, "yea" ..,Mr. Abraham…, "yea" .., Mr. Siegfried.., "yea"

BOARD OF MORROW COUNTY COMMISSIONERS

Tom E. Whiston

Tim D. Abraham

Timothy R. Siegfried

MCC/ch

BEFORE
THE OHIO POWER SITING BOARD

In the Matter of the Application of	**)**	
Blossom Solar, LLC for a	**)**	
Certificate of Environmental	**)**	**Case No. 22-15-EL-BGN**
Compatibility and Public Need	**)**	

Blossom Solar, LLC's July 20, 2022 Supplemental Responses to Staff's July 1, 2022 Data Requests

1. **Please provide Staff with an Unanticipated Discovery Plan which includes course(s) of action to be taken in the event previously unidentified subsurface hazards/features are encountered during construction (e.g., oil and gas well infrastructure, abandoned mines, contaminated soils, etc.).**

   July 15, 2022 Response: *Applicant plans to provide a preliminary plan to Staff by July 20, 2022.*

   Supplemental Response*: A preliminary Unanticipated Discovery Plan for the Project is provided as* ***Attachment 1****.*

4. **Exhibit M indicates a source water protection area has been delineated .3 miles northeast of the project area at Sycamore Creek Golf Course. Please confirm this property's status with Ohio EPA's Source Water Assessment and Protection Program.**

   July 15, 2022 Response: *Applicant plans to submit this information to Staff by July 20, 2022.*

   Supplemental Response*: The Ohio EPA's on-line database no longer identifies a source of groundwater associated with the Sycamore Creek Golf Course.*

<u>Wind Velocity, Ohio Adm.Code 4906-4-08(A)(6)</u>

31. **In accordance with Ohio Adm.Code 4906-4-08(A)(6), please provide an analysis of high wind velocities for the area around the Blossom Solar Project, Morrow County.**

    July 15, 2022 Response*: Applicant plans to provide this information to Staff by July 18, 2022.*

    Supplemental Response*: The closest meteorological stations to the project site were identified for this analysis. The two closest and representative meteorological stations to the project site are:*

- *Marion Municipal Airport (MNN) - approximately 14 miles southwest of the project site*
- *Mansfield Lahm Regional Airport (MFD) - approximately 18 miles northeast of the project site*

Because both meteorological stations are nearby and have complete meteorological data sets, both stations are representative of winds at the project site. Additionally, a review of the site and station elevations indicates that both meteorological stations (MNN = 993 feet and MDF = 1,297 feet) are close in elevation to the project site (1,150 feet) and are representative of the project site.

Meteorological data for years 2017 to 2021 was retrieved for each station from the Ohio ASOS Meteorological Network using the Iowa State University Environmental Meseonet page (https://mesonet.agron.iastate.edu). Maximum observed wind speeds and wind gusts for a five-year period are shown in Table 1 below. Maximum wind speeds depict sustained winds, while maximum wind gusts are considered to be the highest 5-second average wind speed recorded within a 2-minute period.

Table 1 – Nearby Maximum Observed Wind Speeds and Gusts

Parameter	Marion Municipal Airport (mph)	Mansfield Lahm Regional Airport (mph)
Maximum Observed Wind Speed[a]	42.6	41.4
Maximum Observed Wind Gust[b]	66.7	65.6

(a) Wind speed is the average wind speed in a 2-minute period.
(b) Wind gust is the highest 5-second average wind speed during a 2-minute period.

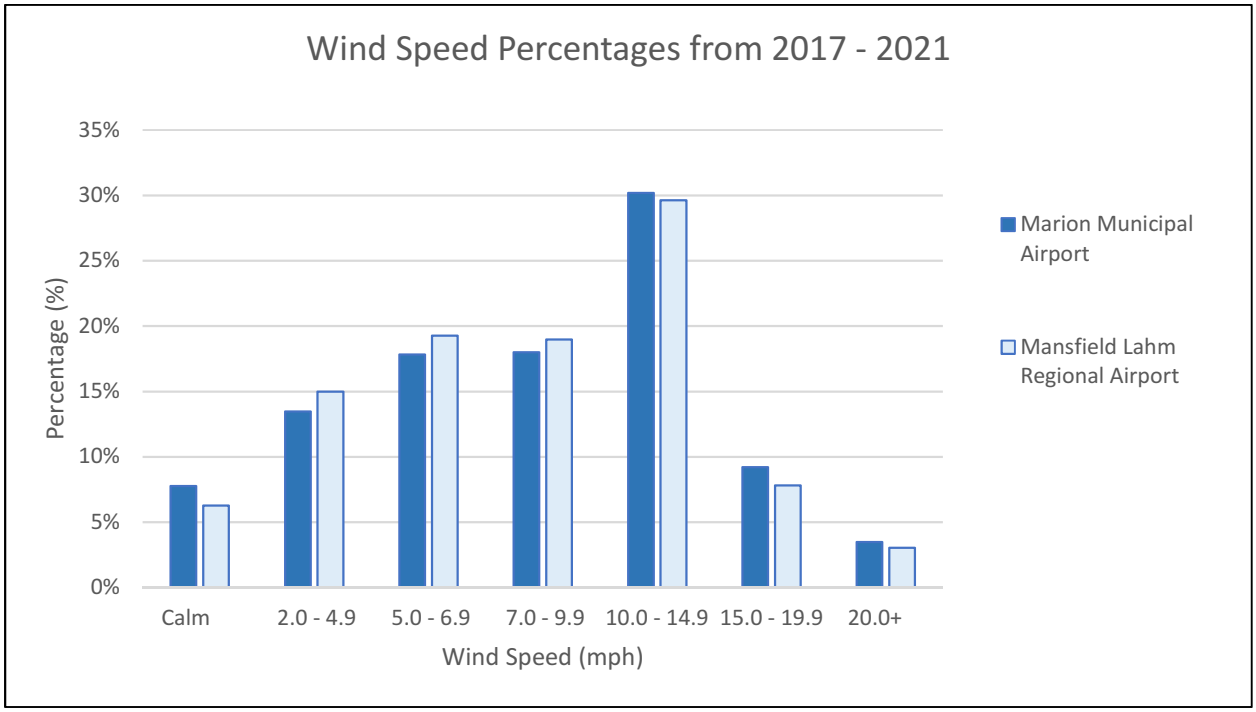
As shown in the above table, the maximum observed wind speed in the project area from 2017 to 2021 was 42.6 miles per hour (mph), and the maximum observed wind gust was 66.7 mph.

32. Provide the range of wind velocities that have been experienced and would be expected to be observed in Blossom Solar Project's project area Morrow County, along with the probabilities or probability distribution for these velocities.

***July 15, 2022 Response**: Applicant plans to provide this information to Staff by July 18, 2022.*

***Supplemental Response**: As discussed in the response to Question #31, the nearby MNN and MFD airports both have complete meteorological data sets and are representative of wind speeds at the project site. Wind speed ranges and percentages for these meteorological stations from 2017 to 2021 are shown in Figure 1.*

Figure 1 – Wind Speed Percentages at MNN and MFD from 2017 to 2022



As shown in the above figure, wind speed distributions at MNN and MFD are similar and are representative of winds at the project site. Wind speeds in the 10-15 mph range are most common, with winds in the 2 to 10 mph range being the next most frequently occurring. Wind roses for MNN and MFD, which depict both the frequency and direction of winds, are included in ***Attachment 2****. The dominant wind direction in the project area is blowing from the southwest.*

Glare

45. Provide a glare analysis of the project.

July 15, 2022 Response*: Applicant plans to submit a glare analysis to Staff by July 20, 2022.*

Supplemental Response*: An analysis of the glare that may be associated with the Project is provided as* ***Attachment 3****.*

Attachment 1

BURNS McDONNELL

Preliminary Unanticipated Discovery Plan for the Blossom Solar Project

Blossom Solar, LLC

Blossom Solar Project

Project No. 132219

7/19/2022

Preliminary Unanticipated Discovery Plan for the Blossom Solar Project

prepared for

Blossom Solar, LLC

Blossom Solar Project

Morrow County, Ohio

Project No. 132219

7/19/2022

prepared by

Burns & McDonnell Engineering Company, Inc.
Columbus, OH

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
AML	Abandoned Mine Land
Blossom Solar	Blossom Solar, LLC
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
HAZWOPER	Hazardous Waste Operations and Emergency Response
N/A	Not Applicable
Ohio DNR	Ohio Department of Natural Resources
Ohio EPA	Ohio Environmental Protection Agency
OPSB	Ohio Power Siting Board
OSHA	Occupational Safety and Health Administration
Project	Blossom Solar Project
SR	State Route

1.0 INTRODUCTION

Burns & McDonnell was retained by Blossom Solar, LLC (Blossom Solar) to develop a preliminary unanticipated discovery plan (Plan) for certain previously unidentified subsurface features for the proposed Blossom Solar Project (Project) in Morrow County, Ohio. The Project is bounded to the south by State Route (SR) 309 (SR-309) and SR-288, extending west to Iberia Bucyrus Road/SR-100 and north to Crawford-Morrow Line Road/County Road 8 just south of Galion, Ohio.

1.1 Purpose

The Project will have significant subsurface environment data regarding a variety of possible features and conditions at the time of final design and start of construction. It is possible, however, that certain features that may affect construction and/or operation of the Project will be discovered during construction. The purpose of this Plan is to guide appropriate responses to the discovery, during the construction of the Project, of certain types of unidentified subsurface features. For these types of features, this Plan provides guidance to support worker and public safety, limit the unintended disturbance of the subsurface feature, identify the steps to characterize and (if necessary) remediate the subsurface feature prior to the resumption of construction, and/or require an adjustment to construction methods and/or the design. After the completion of final design and engineering, but prior to the start of construction, this Plan will be finalized to update any contact information for government officials and provide additional detail regarding construction personnel roles and responsibilities.

1.2 Scope and Terminology

This Plan covers the unanticipated discovery of the following subsurface features during construction not previously identified in the site due diligence for the final design of the Project:

1. ***Contaminated Soil***

   For purpose of this Plan, contaminated soil refers to any significant amount of non-natural material or extensive discoloration of soil that may be the result of a past spill or disposal of waste, oils, or other discarded materials for which it may be necessary to perform

remediation and/or notify appropriate environmental regulatory agencies. Some signs of possible contaminated soil include, but are not limited to:

- Odors from fuel or other hydrocarbon materials that emanate when the soil is disturbed
- Discolored soil compared to surrounding soil
- Oily residue intermixed with soil
- Fill material containing debris unearthed during trenching or grading
- Household trash and/or industrial debris covered by soil or other material
- Rusty barrels or containers
- Combustion process residue, such as ash
- Sheen on the surface of water or on groundwater within a trench or excavation

Additional regulatory definitions and considerations for contaminated soil can be found in Ohio Environmental Protection Agency (Ohio EPA) guidance documents.

2. Well Infrastructure

For purpose of this Plan, well infrastructure refers to any metal piping, well casing, or other structure that may constitute infrastructure for the extraction of oil, gas or other hydrocarbons or for accessing natural supplies of groundwater. Well infrastructure may also include associated buried horizontal piping, vaults and electrical power supplies. It is also possible that contaminated soil that is discovered is associated with past oil and gas exploration activity.

Additional regulatory definitions and considerations for well infrastructure can be found in Ohio Department of Natural Resources (Ohio DNR) guidance documents.

3. Abandoned Mines

For purposes of this Plan, an abandoned mine refers to any significant subsurface void or other open space that may have been a part of an operation for the exploration or extraction of useful or valuable minerals and that may present a safety hazard to workers or require remedial measures prior to the resumption of construction.

Additional regulatory definitions and considerations for abandon mines can be found in Ohio DNR guidance documents.

2.0 INITIAL RESPONSE

This section summarizes the initial response to be taken regarding an unanticipated discovery of certain previously unidentified subsurface features. During construction, all work will be conducted in accordance with worker protection procedures and follow best management practices to complete the activities safely, maintain structural integrity of excavations, and protect existing structures that may be affected by excavations.

2.1 Suspension of Construction Activities

The initial response to an unanticipated discovery of any of the above features will be to stop construction activities in the immediate area of the discovery as soon as it is safe to do so. The designated on-site employee of the construction contractor (e.g., Site Supervisor) with ultimate responsibility for the construction activities at the location where the discovery occurs, shall determine if any immediate health and safety protocols need to be implemented. Once it is determined that it is safe to proceed, a preliminary determination shall be made by the Site Supervisor and the appropriate representative of the owner of the Project (Project Owner) whether it is likely that the feature is addressed by this Plan. If so, then the Plan shall be followed to address the situation. If not, then this Plan does not apply, and construction activities may resume as usual.

The Project Owner may also include an on-site environmental coordinator for the construction of the Project (e.g., Environmental Coordinator) or another environmental professional to assist with initial response activities. If appropriate, the environmental professional shall be trained in the Occupational Safety and Health Administration (OSHA) requirements, Hazardous Waste Operations and Emergency Response (HAZWOPER) procedures, including the use of personal protective equipment (PPE), sampling procedures, and decontamination protocols.

2.2 Demarcation of Investigation Zone

If the Plan applies to the feature, then an appropriately sized area around the feature shall be defined in which, during the implementation of this Plan, construction activities will cease and only personnel addressing the feature will have access (Investigation Zone). The purpose of the Investigation Zone is to allow for the safe assessment of the nature and extent of the feature.

Unless circumstances in the field suggest an alternative approach, the initial Investigation Zone will be a rough circle with a minimum radius as follows:

Type of Feature	Minimum Radius of Initial Investigation Zone (feet)
Contaminated Soil	25
Well Infrastructure	50
Abandoned Mine	100

The above sizes are minimums and are not necessarily aligned with specific state or federal regulations associated with spill/release requirements. Furthermore, a larger area may be appropriate to address the specific conditions of the feature. Also, the initial Investigation Zone may be changed in size or shape as the investigation proceeds (including making it smaller), as appropriate to the circumstances. The Investigation Zone will be marked by a temporary barrier, such as an orange plastic construction fence. At all times, unless on-site conditions dictate otherwise, construction activities shall be suspended within the Investigation Zone, but may continue outside the Investigation Zone.

2.3 Initial Summary Report

The Site Supervisor shall prepare and provide to the Project Owner a brief description of the feature discovered, accompanied by photographs, the general location of the Investigation Zone, and a summary of the next steps that will be taken to assess the nature and extent of the feature pursuant to this Plan and in accordance with federal, state and/or local regulatory requirements.

2.4 Notifications

Once the determination that this Plan applies, the demarcation of the Investigation Zone, and the submittal of an initial summary report are completed, the following notifications will be made:

A. Ohio Power Siting Board

The lead staff contact for the Project at the Ohio Power Siting Board (OPSB) will be notified via e-mail in the event an unanticipated discovery is confirmed. The summary information

will list the discovery of the feature, its suspected nature, its general location, and the status of the investigation. OPSB staff will be kept appraised of the matter at the frequency and level of detail requested by OPSB staff.

B. On-Site Environmental Coordinator

The Environmental Coordinator will be notified as soon as possible of the discovery of contaminated soil, abandoned mine or well infrastructure.

C. Regulatory Agencies

The appropriate personnel at the Ohio EPA will be notified in accordance with Ohio EPA reporting requirements of the discovery of contaminated soil.

The appropriate personnel at the Ohio DNR will be notified in accordance with Ohio DNR reporting requirements of the discovery of well infrastructure associated with oil and gas activity.

In accordance with Morrow County notification or reporting requirements, the Morrow County Health Department will be notified of the discovery of well infrastructure associated with natural sources of water.

The Abandoned Mine Land (AML) Program within the Division of Mineral Resources Management of ODNR will be notified in accordance with ODNR reporting requirements of the discovery of an abandoned mine.

D. Landowner

The owner or owners of the parcel on which the feature is located, or their representative (Landowner) will be notified of the discovery of the feature. The Landowner may have useful information about the nature and/or extent of the feature, an economic interest in any infrastructure or minerals, and a general interest in the existence of the feature and any response to it.

E. Contact Information

Contact information for state and local government officials is shown in the following tables.

Contaminated Soils

Agency	Phone	Fax
OEPA, Office of Emergency Response		
24-hour Emergency Spill Hotline	(800) 282-9378	Not applicable (N/A)
Non-Emergency	(614) 644-3194	N/A
Central District Office	(614) 728-3778	N/A

Well Infrastructure – Abandoned Water Wells

Agency	Phone	Fax
Morrow County Health Department	(419) 94-1545	N/A

Well Infrastructure – Orphan Oil and Gas Wells

Agency	Phone	Fax
ODNR, Division of Oil and Gas Resources		
Emergency Reporting	(844) 642-2551	N/A
Morrow County Inspector	(740) 644-1346	N/A
Orphan Well Program	(330) 620-5642	N/A
Central Office (Columbus)	(614) 265-6922	

Abandoned Underground Mines

Agency	Phone	Fax
ODNR, Division of Mineral Resources Management: Abandoned Mine Land (AML) Program		
Emergency Program Response	(614) 265-6790	N/A
Non-Emergency AML Response	(770) 274-4947	N/A
Central Office (Columbus)	(614) 265-6633	(614) 265-7999

Contact information for federal agencies, if necessary, is shown in the following table.

Agency	Phone	Fax
National Response Center	(800) 424-8802	N/A
US EPA Region 5	(312) 353-2000	N/A

3.0 SITE ASSESSMENT AND REMEDIAL MEASURES

The following procedures will be used to determine the extent, nature, and disposition of the feature.

3.1 Contaminated Soil

In the event site assessment actions are required in accordance state and federal regulation, a plan to characterize and address contaminated soil will be coordinated with appropriate personnel from Ohio EPA and the Landowner. In accordance with state requirements, the area of contaminated soil will be delineated, and contaminated soil either will be avoided by Project infrastructure or will be removed from the site and disposed of in accordance with applicable laws and regulations. If necessary, a specialized contractor will be retained to characterize and/or remove and dispose of the contaminated soil. The contractor will fully comply with all applicable OSHA requirements and, if necessary, adhere to HAZWOPER procedures. Site conditions before, during and after any remediation work will be fully documented, including with photographs. A report of the assessment and remediation of the feature will be prepared.

3.2 Well Infrastructure

Well infrastructure associated with water supply, including any associated piping and power, will be decommissioned in accordance with all applicable laws and regulations. A report of the decommissioning activity will be prepared.

Measures to address well infrastructure associated with oil and gas exploration and recovery will be coordinated with the Landowner and if needed with the appropriate personnel from ODNR. An on-site inspection of the well infrastructure will be conducted. After the inspection, a summary letter report will be prepared discussing the findings of the inspection activities.

3.3 Abandoned Mines

Measures to address an abandoned mine will be addressed from a geotechnical engineering perspective in consultation with personnel from the AML Program at ONDR. If required, the letter report of the assessment and resolution of the feature will be prepared.

4.0 DOCUMENTATION

Written documentation prepared pursuant to this Plan and as required by appropriate regulatory agencies will be provided to OPSB staff and maintained for at least six (6) months following the completion of construction.

BURNS McDONNELL

CREATE AMAZING.

Burns & McDonnell World Headquarters
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Kansas City, MO 64114
O 816-333-9400
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www.burnsmcd.com

Figure A-1 – Marion Municipal Airport Wind Rose (2017 to 2021)

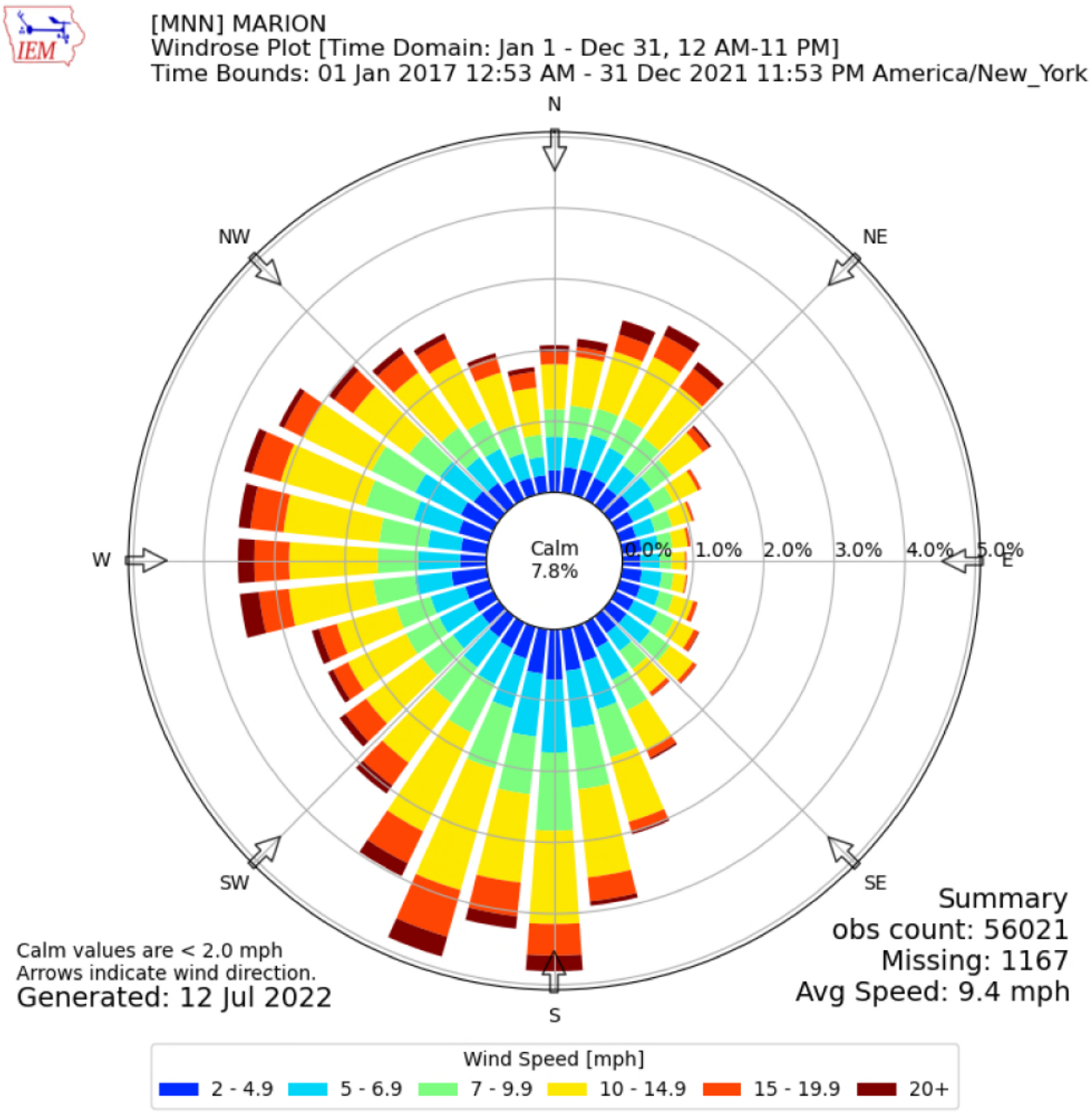
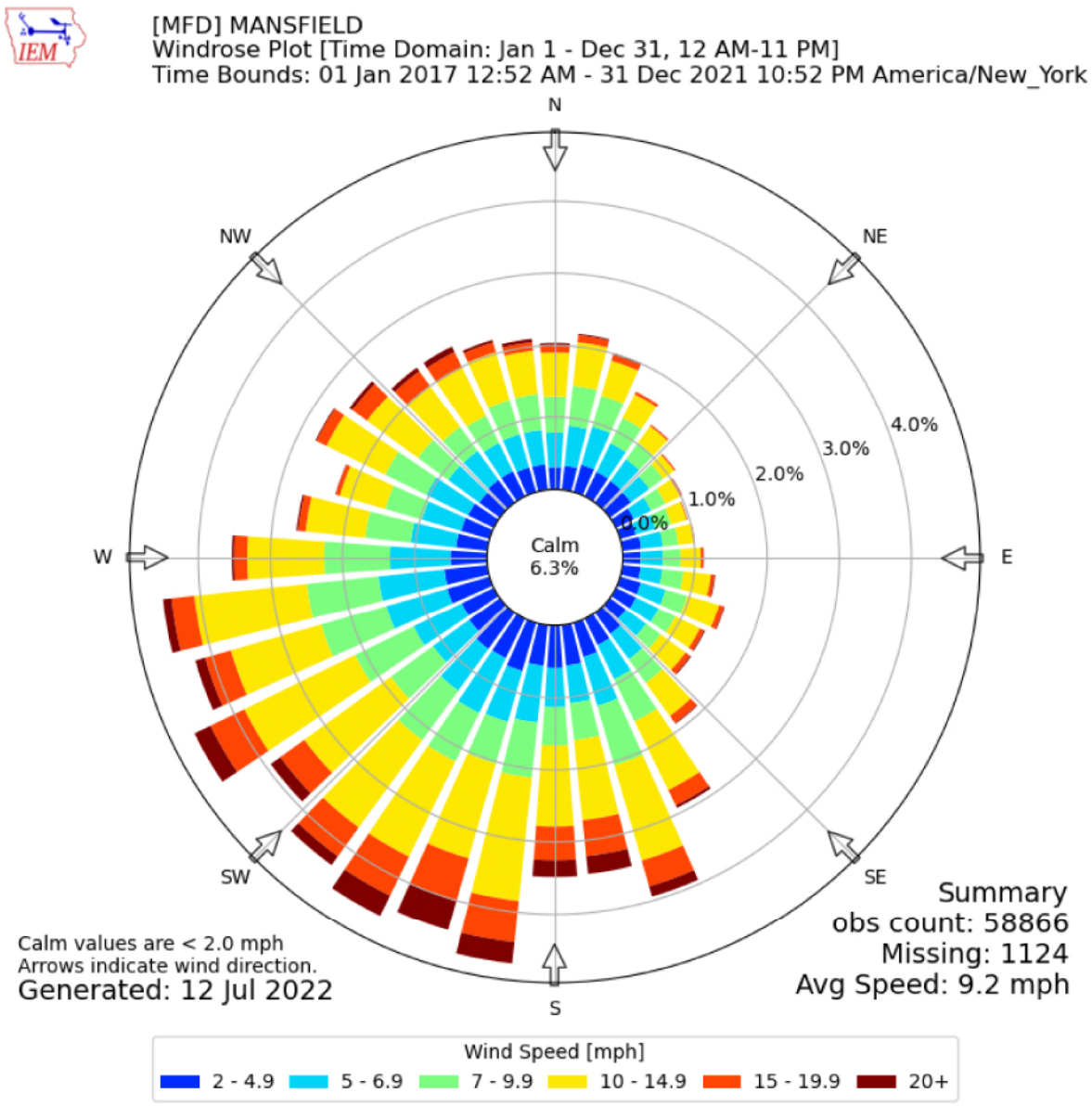


Figure A-2 – Mansfield Lahm Regional Airport Wind Rose (2017 to 2021)



Blossom Solar Glare Study

Blossom Solar, LLC

Blossom Solar Project
Project No. 133219

Revision 1
7/20/2022

Blossom Solar Glare Study

prepared for

Blossom Solar, LLC
Blossom Solar Project
Morrow County, Ohio

Project No. 133219

Revision 1
7/20/2022

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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EXECUTIVE SUMMARY

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
AC	Alternating Current
Airport	Galion Municipal Airport (KGQQ)
ATCT	Air Traffic Control Tower
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
DC	Direct Current
FAA	Federal Aviation Administration
FP	Flight path
GSD	Glare simulating device
kW	Kilowatt
LOS	Line-of-sight
MW	Megawatt
OP	Observation point
PR	Path Receptor
Project	Blossom Solar Project
PV	Photovoltaic
SGHAT	Solar Glare Hazard Analysis Tool
SGOHP	Solar Glare Ocular Hazard Plot
Study	The glare study for the proposed Blossom Solar Project

DISCLAIMERS

In preparation of this report, Burns & McDonnell has relied upon information provided by Blossom Solar, LLC and other third-party sources. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Burns & McDonnell's estimates, analyses, and recommendations contained in this report are based on professional experience, qualifications, and judgment. Burns & McDonnell has no control over weather; cost and availability of labor, material, and equipment; labor productivity; energy or commodity pricing; demand or usage; population demographics; market conditions; changes in technology; and other economic or political factors affecting such estimates, analyses, and recommendations. Therefore, Burns & McDonnell makes no guarantee or warranty (actual, expressed, or implied) that actual results will not vary, perhaps significantly, from the estimates, analyses, and recommendations contained herein.

This report is for the sole use, possession, and benefit of Blossom Solar, LLC for the limited purpose as provided in the agreement between Blossom Solar, LLC and Burns & McDonnell. Any use or reliance on the contents, information, conclusions, or opinions expressed herein by any other party or for any other use is strictly prohibited and is at that party's sole risk. Burns & McDonnell assumes no responsibility or liability for any unauthorized use.

1.0 EXECUTIVE SUMMARY

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was retained by Blossom Solar, LLC to conduct a glare Study for the proposed Blossom Solar Project (the "Project") located in Morrow County, Ohio, approximately 4 miles southwest of the town of Galion, Ohio (the "Study"). The purpose of the Study was to identify the potential glare from the Project on potential sensitive receptors near the Project site.

A total of two-hundred and two (202) observation points (OPs) representing stationary observers at residences and seven (7) path receptors (PRs) representing observers operating a motor vehicle on adjacent roads were identified and evaluated for potential for glare from the Project. The first part of the Study consisted of evaluating each receptor for the ocular hazard from potential glare utilizing the Solar Glare Hazard Analysis Tool (SGHAT) that was developed by Sandia National Laboratory in conjunction with the Federal Aviation Administration (FAA) and licensed for commercial use to ForgeSolar. One of the outputs from the SGHAT is the Solar Glare Ocular Hazard Plot (SGOHP) which identifies if the glare has the potential for retinal damage, the potential for afterimage (an optical illusion that refers to an image continuing to appear after exposure to the original image has ceased), or the low potential for afterimage.

The second step of the evaluation, if glare were identified at the receptor, evaluated the line of sight (LOS) to determine the receptors that have an unobstructed LOS from the source of glare to the glare receiver at the receptor using the latest available satellite imagery via desktop analysis. The LOS results from the receptors to the arrays were categorized as visible, marginally visible, or not visible (completely obstructed) due to geography, existing vegetation, structures, or other objects for a receptor that was determined to receive glare from the Project. These results were then combined with the SGHAT output to determine if glare could present an ocular hazard for the viewer with an unobstructed LOS from the source of the glare to the receptor. While evaluating the LOS for instances of glare, the direction of the glare relative to the sun for the receptor's field of view was also noted.

From the SGHAT analysis it was determined that there was potential for unobstructed glare in eighteen (18) separate instances, when considering existing visual screening, for the OPs and PR evaluated in the study. It is important to note that all instances of glare noted occur during periods of back-tracking and during hours immediately following sunrise and immediately preceding sunset hours. The reflected/refracted light is located in a similar region of an observer's field of view as the sun during these periods, which is a regularly occurring and substantially brighter source of light. Accordingly, the glare noted in this analysis is not considered to present a novel ocular hazard to the assessed receptors as

observers would be affected to a higher degree by the sunlight occurring from a similar direction and time as the glare that is noted in this analysis.

1.1 Background

Both glint (a momentary flash of light) and glare (a more continuous source of excessive brightness relative to the ambient lighting) (Ho, Relieving a Glaring Problem, 2013) were included as part of this Study. For purposes of this report, glint and glare are referred to collectively as "glare".

Concerns have been raised that glare could be considered hazardous to drivers, observers, and residents around solar photovoltaic (PV) projects. Therefore, the potential for glare from a solar project can be analyzed to determine the impact of solar PV projects on the surrounding area. Sandia National Laboratories developed the SGHAT which determines the risk of glare potential from solar energy systems (Sandia National Laboratories, 2019). However, the SGHAT was designed to predict glare for pilots on the landing approach to a runway or for air traffic control towers (ATCT) which are positioned well above the ground level for an area. As such, the tool is limited in its ability to predict ocular hazard for ground-level observers that might have an obstructed view of the installation, and may over-estimate actual glare.

Specifically, the SGHAT does not account for changes in topography, vegetation, or structures that would partially or completely obstruct the view from OPs on the ground and remove the potential for ocular hazards at those points. To address this limitation, an LOS analysis is recommended to be performed following the glare analysis for ground-level observers when potential glare is identified by the SGHAT. These results are combined to determine the potential for ocular hazard from glare on the surrounding area for a proposed Project.

Back-tracking is a tracking methodology commonly used for single-axis tracking racking systems. Glare from back-tracking can often reflect/refract to an observer from the same direction as the sun. The sun is a substantially brighter and regularly occurring source of light that can cause afterimage in an observer. As such, it is recommended that if glare is identified it should also be evaluated to determine if it is occurring from the same direction as the sun for an observer to assess if the proposed installation introduces a novel ocular hazard that was not present before (e.g. a bright source of light that from a direction an observer would not be expecting light to be coming from).

1.2 Site Overview

The Project is located in in Morrow County, Ohio, approximately 4 miles southwest of the town of Galion, Ohio. While equipment selections and ratings during preliminary Project development are subject

to change, the site was modeled with parameters typical of a utility-scale PV system utilizing single-axis tracking racking solution which is expected for the Project. The anticipated placement of trackers on the Project site and the locations of the receptors can be observed in Attachment 1.

1.3 Glare Analysis

To perform the glare analysis the SGHAT licensed to ForgeSolar was utilized (Sandia National Laboratories, 2019). The SGHAT allows the user to specify a site location, draw an outline of the proposed PV array, and specify observer locations. Once these parameters are given, the properties of the arrays such as the tracking type, tilt, module surface type, and orientation can be specified for each array. Latitude, longitude, and elevation for each receptor and array vertex are tracked and used for sun position and vector calculations to determine glare for that OP (ForgeSolar, 2019).

The SGHAT output indicates if there is potential for glare at the identified receptors. If glare exists, SGHAT creates the SGOHP which identifies the degree of the hazard, the source, and the time it occurs. The plot is a function of retinal irradiance and subtended angle (i.e., the size/distance of the glare source) and was developed based on studies conducted in the 1970 (see "Evaluation of Optical Radiation Hazards," David C. Sliney & Benjamin C. Freasier, 1973, Applied Optics and "Eye Hazard and Glint Evaluation for the 5-MWt Solar Thermal Test Facility," T.D. Brumleve, 1977, for the complete reports from the studies).

The SGHAT evaluated the potential ocular hazard at the receptors for a full calendar year. The SGHAT analysis is based on the sun's path through the sky. The path of the sun is on approximately a 20,000 to 100,000-year cycle known as the Milankovitch Cycles (UCAR, 2019). SGHAT uses the current cycle (i.e., values for eccentricity, precession, and axial tilt) in the calculations. Therefore, any change in eccentricity, precession, or axial tilt year to year is immaterial and a reference to a particular calendar year in the results is not necessary. Furthermore, SGHAT does not account for daylight savings time, so all times of potential glare seen on the respective plots from SGHAT are based on Greenwich Mean Time for that location.

The ocular hazard determined by the SGHAT was assigned a color value of green, yellow, or red based on the SGOHP for received retinal irradiance and subtended angle in increasing concern respectively. For those receptors that were determined to have a potential for glare, a LOS analysis was then conducted to verify if the glare was unobstructed from the array to the locations identified as receiving glare at the receptor. It should be noted that no receptors in this Study were given a determination of red glare by the SGHAT, i.e., the glare did not have the potential to cause retinal burn. Red glare is typically only possible

for concentrated solar-thermal projects, which are designed and fundamentally operate differently than solar photovoltaic projects. Concentrated solar-thermal projects use large arrays of mirrors focusing to a central point or arrays of parabolic throughs of mirrors to focus sunlight to heat a material, which is then used to boil water that feeds a steam turbine to generate electricity. Solar photovoltaic projects by design and do not intentionally concentrate sunlight, which would be necessary to produce glare that has the potential to cause retinal burn. From Burns & McDonnell's experience on solar photovoltaic projects it has not observed any solar photovoltaic projects that have produced glare with the potential to cause retinal burn on the areas surrounding the project.

1.4 Line-of-sight Analysis

The LOS from the receptors to the arrays, if assessed, were categorized as visible, marginally visible, or not visible (completely obstructed) due to geography, existing vegetation, structures, or other objects. These results are then combined with the SGHAT output to determine if glare could adversely impact surrounding properties near the specified receptor with an unobstructed LOS. If no potential for glare was noted from the SGHAT then the LOS was not evaluated as there was potential for glare noted that may need further mitigation with visual obstructions to the LOS. While evaluating the LOS for instances of glare, the direction of the glare relative to the sun for the receptor's field of view was also noted.

2.0 BACKGROUND

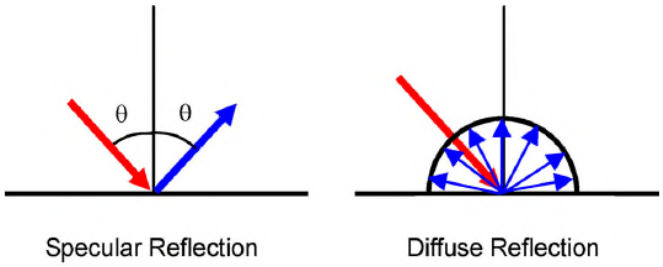
2.1 Definition of Glare

Glint is typically defined as a momentary flash of bright light, often caused by a reflection off a moving source. A typical example of glint is a momentary solar reflection from a moving car. Glare is defined as a continuous source of bright light. Glare is generally associated with stationary objects, which, due to the slow relative movement of the sun, reflect sunlight for a longer duration. The difference between glint and glare is duration. Industry-standard glare analysis tools evaluate the occurrence of glare on a minute-by-minute basis; accordingly, they generally refer to solar hazards as 'glare' (ForgeSolar, 2019).

2.2 Reflected Light

Reflected light can be characterized as a combination of specular (mirror-like) and diffuse (scattered) reflections. See Figure 2-1 for an illustration.

Figure 2-1: Specular and Diffuse Reflection



Source: (Ho, Chanbari, & Diver, 2011)

Smooth surfaces such as mirrors and smooth glass produce more specular reflections with greater intensity (i.e., larger retinal irradiances/energy that reaches the retina) and tighter beams (smaller subtended angles, i.e., the size of reflection in the eye), while solar receivers, textured glass, and anti-reflective coatings produce more diffuse reflections with lower solar intensities (less energy) but greater subtended angles (larger size). See Figure 2-2 for an example.

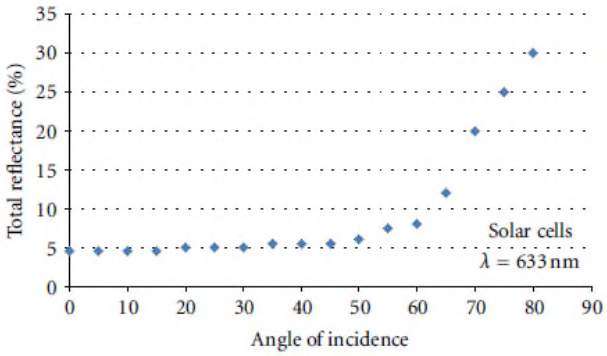
Figure 2-2: Example of Specular and Diffuse Reflections

Source: (Ho, Relieving a Glaring Problem, 2013)

Specular reflection is shown on the left of Figure 2-2 demonstrating a smaller reflection (i.e., lower subtended angle/size to the eye) and the reflections get more diffuse to the right in the figure. The diffuse reflection has a lower intensity when viewed at nearly normal (i.e., when the angle of incidence/reflection is perpendicular to the module as shown as the vertical line in Figure 2-1 above). However, the intensity of the reflection from the module with the anti-reflective coating increases with an increase in the angle of incidence, angle theta in Figure 2-1 above (i.e., when the sun is lower in the sky).

This is important to note because the OPs representing residences and the PRs representing roadways are near ground level. Therefore, the sun will need to be low on the horizon to create glare observable at the ground-level receptors. This increased angle of incidence increases the intensity of the glare. The specular reflectance of mirrors can be greater than 90 percent, while the specular reflectance of PV glass can be as low 1 to 2 percent at near normal incidence angles (i.e., perpendicular to the PV glass). However, at higher angles of incidence, e.g., when the sun is low on the horizon, the glare from PV glass can be quite substantial. The reflectance off solar PV modules at these higher angles of incidence is still much less than other materials like snow, aluminum, etc. but because of this increased level of reflectance, it is worth studying the effects of glare from solar modules. See Figure 2-3 for the relationship between reflectance and the angle of incidence.

Figure 2-3: Reflectance Per Angle of Incidence



Source: (Riley & Olson, 2011)

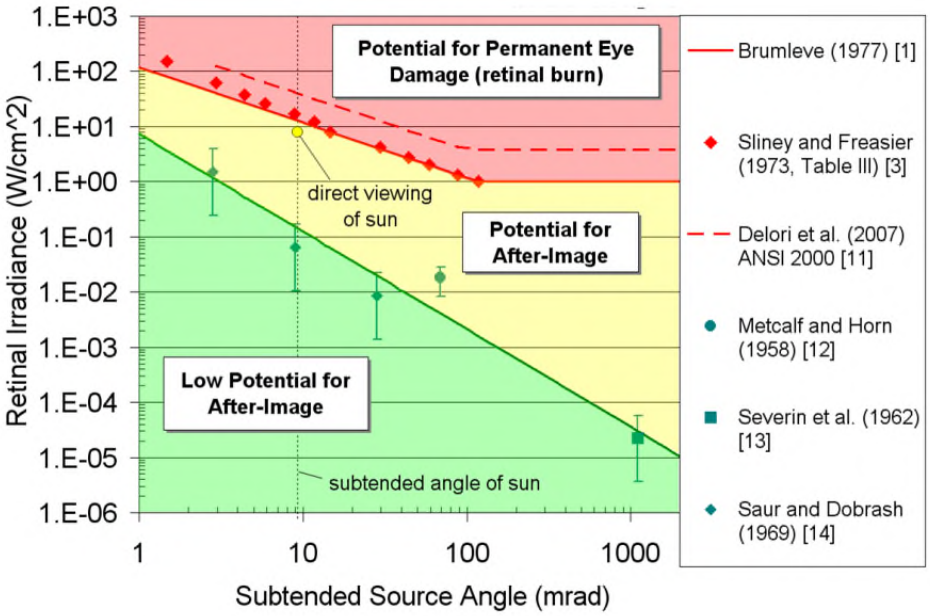
2.3 Solar Glare Hazard Analysis Tool

To understand and model glare in accordance with FAA standards, Sandia National Laboratories developed the Solar Glare Hazard Analysis Tool. To perform the glare analysis for this Study, the SGHAT, licensed for commercial use to ForgeSolar, was utilized (ForgeSolar, 2019). The SGHAT allows the user to specify a site location, draw an outline of the proposed PV array, and specify receptor locations. Once these points are given the properties of the arrays such as the tracking type, tilt, module surface type, and orientation can be specified as well for each array. Latitude, longitude, and elevation for each receptor and array vertex are tracked and used for sun position and vector calculations to determine glare for that receptor. Additional information regarding reflectance, environment, receptor viewing angles, and ocular factors can be altered, however typical values were utilized that are typically acceptable per the FAA.

The ocular impact of glare is visualized with the Solar Glare Ocular Hazard Plot. This chart displays the ocular impact as a function of glare subtended source angle and retinal irradiance. Each minute of glare is displayed on the chart as a small circle in its respective hazard zone. For convenience, a reference point is provided which illustrates the hazard from viewing the sun without filtering (i.e., staring directly at the sun). Each plot includes predicted glare for one (1) PV array and one (1) receptor (ForgeSolar, 2019).

The SGOHP can be observed in Figure 2-4.

Figure 2-4: Solar Glare Ocular Hazard Plot



Source: (ForgeSolar, 2019)

If glare is found, the SGHAT calculates the retinal irradiance and subtended angle (size/distance) of the glare source, defines how many minutes of "green glare", "yellow glare", and "red glare" exist at the receptor, and produces the SGOHP. (Note: Subtended angle is ω in Figure 2-5.) The SGHAT assumes an unobstructed line of sight from the arrays to the receptor. Any obstructions to that line of sight will have the effect of reducing the subtended angle of the glare and the retinal irradiance. As can be noted in Figure 2-4, reducing the subtended angle, i.e., the amount of glare that can be seen, the effect of the glare would move leftward on the SGOHP. Similarly, reducing the retinal irradiance, i.e., the intensity of the glare on the retina, the effect of the glare would move downward on the SGOHP.

The "green glare", "yellow glare", and "red glare" correspond to instances with a low potential for afterimage, potential for afterimage, and potential for permanent eye damage, respectively. These categories assume a typical blink response in the observer. Note that retinal burn, the region indicated as "red glare", is typically not possible for PV glare since PV modules do not focus reflected sunlight.

Other results from the SGHAT are a plot that specifies when glare will occur throughout the year and at what times with color codes indicating the potential ocular hazard. The SGHAT can also predict relative energy production while evaluating alternative designs, layouts, and locations to identify configurations that maximize energy production while mitigating the impacts of glare. However, for the purposes of this Study, only the potential ocular hazard of the installation without optimization was considered.

The SGOHP was developed based on studies utilizing rabbits and monkeys to study the effects on the retina (Brumleve, 1977). The studies calculated the energy in watts per square centimeter (W/cm^2) that would impact the retina and what the effect on the retina would be. The diagram in Figure 2-5 was used for some of the calculations. Detailed equations, assumptions, and calculations are contained in the Study report (Brumleve, 1977).

Figure 2-5: Diagram for Calculating Glare Hazard Effects

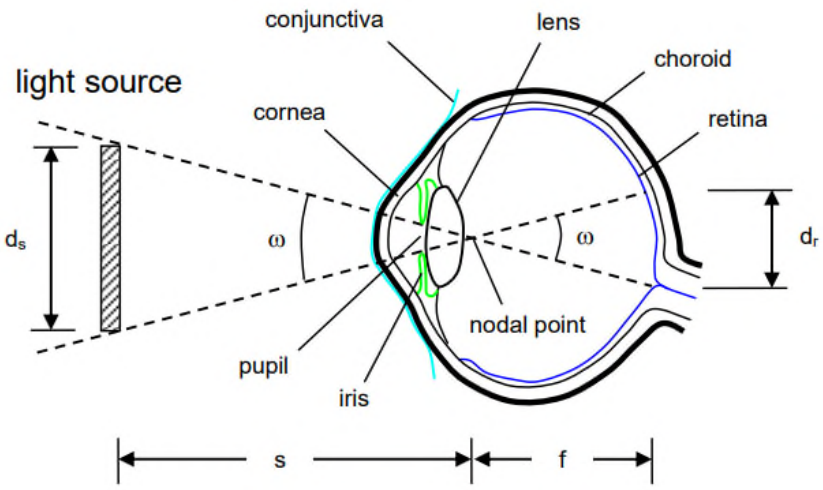
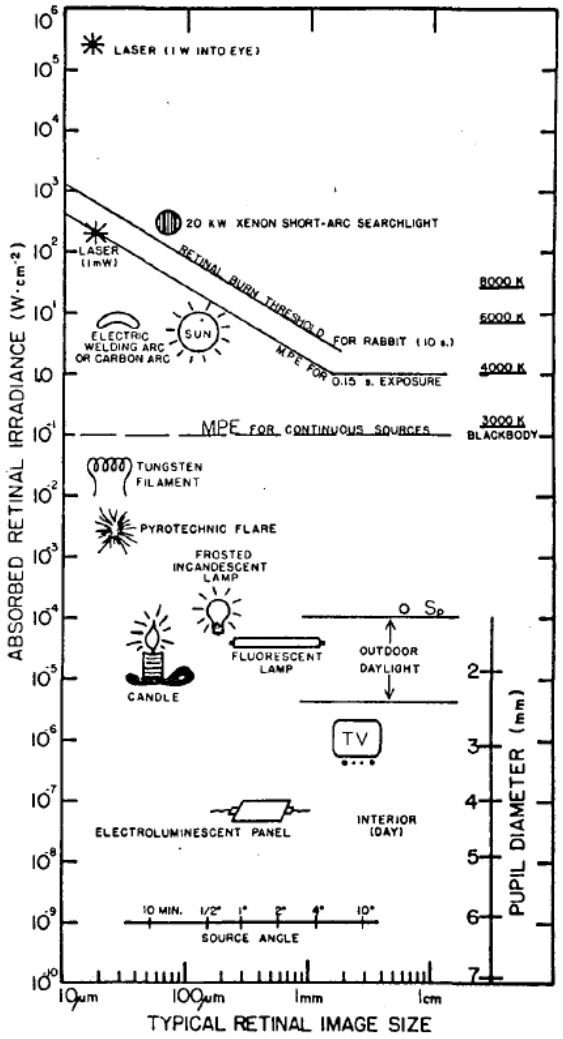


Figure 2-6 below shows the original plot from the Study done in 1977. The critical point to note in the figure is the relative effects of common light sources.

Figure 2-6: Typical Light Sources and Eye Damage Thresholds



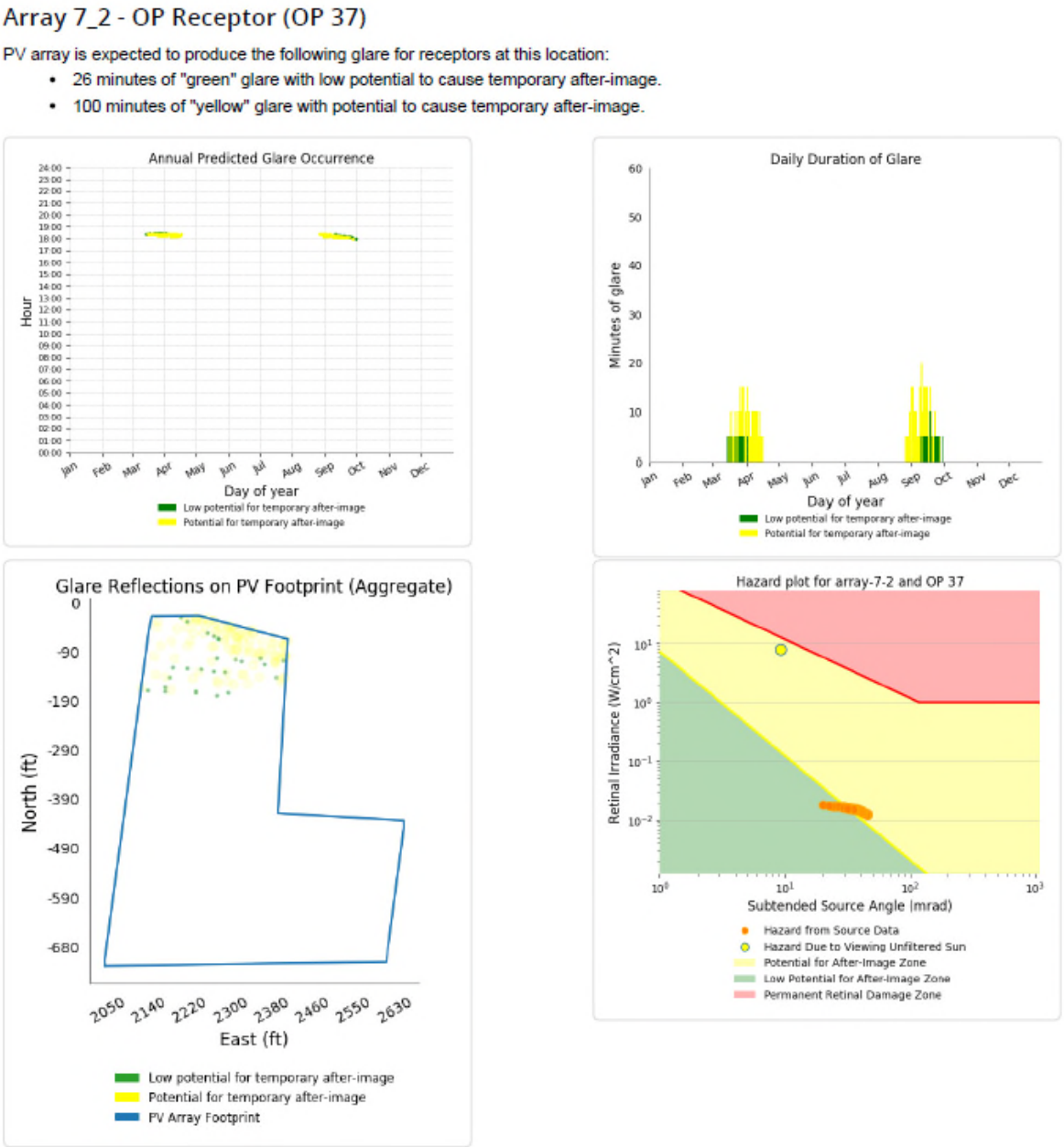
Source: (Brumleve, 1977)

Note: The eye is exposed to light sources having radiances varying from ~10^4 W/cm^2 to ~10^{-6} W/cm^2 and less. The resulting retinal irradiances vary from ~200 W/cm^2 down to 10^{-7} W/cm^2 and even lower; retinal irradiances are shown for typical image sizes for several sources. A minimal pupil size was assumed for intense sources, except for searchlight. The retinal burn threshold for a 10-second exposure of the rabbit retina is shown as the upper solid line. The maximum permissible exposure (MPE) applied by the U.S. Army Environmental Hygiene Agency in evaluating light sources is shown as the lower solid line. Threshold for permanent shift of blue-cone sensitivity in monkeys obtained by Sperling is shown as o Sp at 3 x 10^{-4} W/cm^2. Approximate pupil sizes are shown at lower right based upon exposure of most of the retina to light of the given irradiance. (Extracted from Sliney and Freasier) (Brumleve, 1977)

A sample of the SGHAT output can be observed in Figure 2-7. In this example, there is glare from Array 7_2 at OP37. It can be observed in the Annual Predicted Glare Occurrence plot that there is glare with a potential for temporary afterimage, “yellow glare”, occurring between 6:00 pm and 7:00 pm during the

months of March, April, and September and glare with a low potential of afterimage, “green glare”, occurring closer to 7:00 pm. The SGOHP shows that the retinal irradiance of the glare has over 200 times less energy than looking directly at the sun. It can also be noted in the example that the glare can be up to 15 minutes in duration from the “Daily Duration of Glare” plot and is originating from the northern section of Array 7_2 in the Glare Reflections on PV Footprint (Aggregate) plot. To reiterate, the plots in Figure 2-7 are example figures and are not representative of the results for the Project evaluated in this report.

Figure 2-7: Example Output from the SGHAT



2.4 Definition of Afterimage

Afterimage is a type of optical illusion in which an image continues to appear briefly even after exposure to the actual image has ended. Glancing at the bright midday sun or the glare of bright headlights at night are two instances that might produce this type of afterimage. This brief exposure to an intense source of light often produces a positive afterimage (Cherry, 2018).

This definition is what the SGOHP describes as potential for afterimage, and it should be noted that the afterimage continues only briefly, and it is a temporary effect. To illustrate the temporary effect of an afterimage, an example is included below that elicits an afterimage in a typical viewer when viewed on a backlit computer monitor. Staring at the center of Figure 2-8 for 10 to 30 seconds without blinking and then looking away at a white background will produce a negative afterimage with the word "Afterimage" still observable. To reiterate, this effect is temporary, and the reader should note that the afterimage will dissipate with regular blinking and looking away from Figure 2-8.

Figure 2-8: Example of Afterimage

Source: Wikipedia Commons Public Domain, submitted by Freakmighty Images

2.5 FAA Glare Hazard Study

The FAA established an interim policy in 2013 relating to glare from solar projects (FAA, 2013). The FAA determined that for pilots, no yellow or red glare is allowable on the landing approach, green glare is acceptable on the landing approach, and there are no restrictions for when regularly flying the plane. See

below for exact wording on page 2 of Federal Register / Vol. 78, No. 205 / Wednesday, October 23, 2013 / Notices:

> "No potential for glare or 'low potential for afterimage' (shown in green in Figure 1) along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP). The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath." (FAA, 2013)

In 2015, the FAA conducted a study on pilots to determine how glare may impact a pilot's ability to fly the airplane and read the instrumentation ("Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach," Jason A. Rogers, Clifford K. Ho, Andrew Mead, Angel Millan, Melissa Beben, Gena Drechsler, July 2015.). The FAA used a flight simulator to simulate actual flying and positioned glare simulating devices (GSD) (i.e., lights, outside the cockpit) to simulate glare. Four (4) GSDs were placed straight ahead of the pilot (0 degrees), and at 25, 50, and 90 degrees away from straight ahead.

Figure 2-9: Interior View of Cockpit With 0-degree GSD Triggered

Pilots were asked to rate the degree of impairment from the simulated glare on their ability to fly the plane using the following scale:

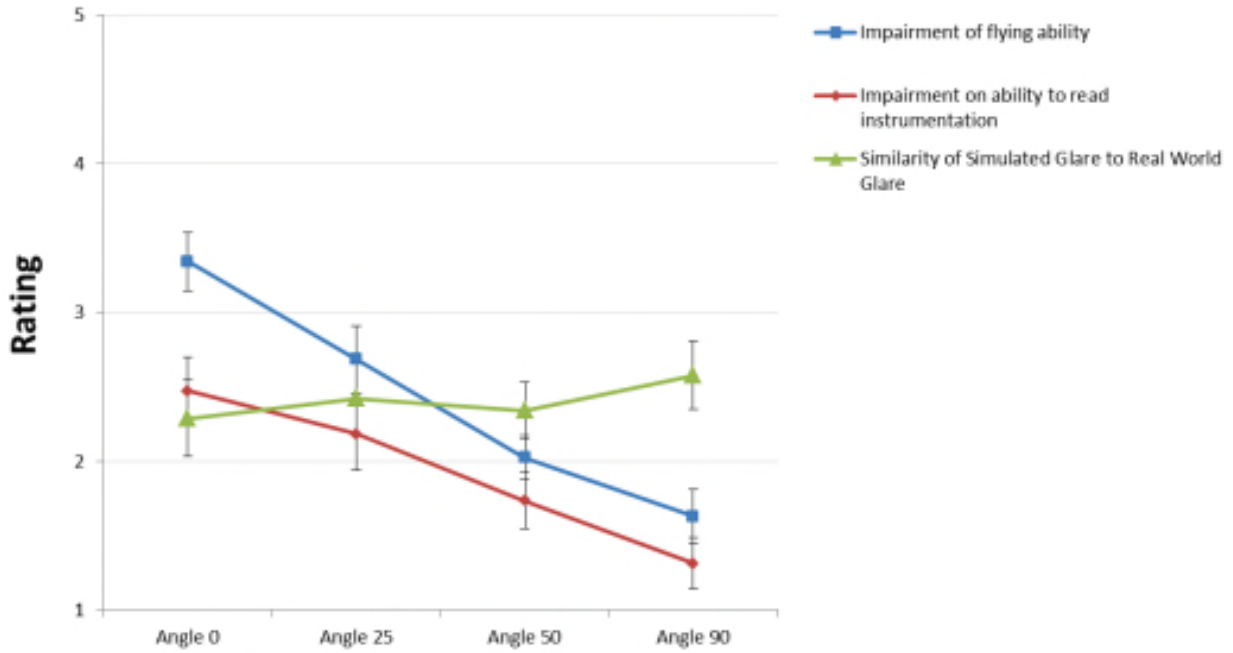
- 1 = No impairment: Can easily perform functions necessary to fly the plane with no noticeable impact of glare
- 2 = Slight to no impairment: Can still perform functions necessary to fly the plane, but glare is noticeable
- 3 = Moderate impairment: Can perform functions necessary to fly the plane, but glare required some action (e.g., physically blocking glare, averting eyes)
- 4 = Significant impairment: Difficulty performing functions necessary to fly the plane, even after performing actions in response to glare
- 5 = Severe impairment: Unable to perform functions necessary to fly the plane

Pilots were asked to rate the degree of impairment from the simulated glare on their ability to read their instruments using the following scale:

- 1 = No impairment: Can easily read instruments and values (e.g., altitude, speed) with no noticeable impact of glare
- 2 = Slight to no impairment: Can still read instruments and values, but glare is noticeable
- 3 = Moderate impairment: Can read instruments and values, but glare required shifting of eyes, blinking, or refocusing in order to read values
- 4 = Significant impairment: Difficulty reading instruments and values, even after shifting of eyes, blinking, or refocusing
- 5 = Severe impairment: Unable to read instruments and values
- N/A (did not view instruments during or after glare event)

Pilots ranged in age and flying experience as well as eyesight characteristics. Several pilots used corrective lenses when flying (contacts or glasses) and some had had corrective surgery. Results of the Study are summarized in the Figure 2-10 below (Rogers, et al., 2015). For completeness, the green line with the triangles in Figure 2-10 represented the pilot's evaluation of the glare in the simulation to the similarity of glare occurring in the real world.

Figure 2-10: Mean Ratings of Impaired Flying Ability



The Study concluded that the presence of glare was associated with the most impairment in the pilot's ability to see their instruments and to fly their airplane when the glare was straight ahead (angle 0-degrees), as well as slightly to the side, i.e., within 25 degrees of straight ahead. It was noted that the more forward the glare was and the longer the glare duration, the greater the impairment to the pilots' ability to see their instruments and to fly the aircraft (Rogers, et al., 2015).

These results taken together suggest that any sources of glare at an airport may be potentially mitigated if the angle of the glare is greater than 25 degrees from the direction that the pilot is looking in (Rogers, et al., 2015). Case in point, at the Shafter-Minter Field, a relatively small general aviation facility, the FAA required a reflectivity analysis on the potential impacts of glare on aircrafts on final approach. The analysis showed that while there is a potential for an afterimage, that effect occurs when aircrafts are perpendicular to the glare source and it would be a brief occurrence in the pilots' peripheral view. The FAA issued a "determination of no hazard to air navigation" for the project (Barrett, 2013).

Applying a similar standard to vehicle operations, it was determined that glare outside of 25 degrees from normal direction of travel (i.e., straight ahead), could be considered to have only a slight to moderate impact on one's ability to operate the vehicle. Glare occurring outside of that range would not pose an ocular hazard and would be considered to not adversely impact vehicle operators.

3.0 METHODOLOGY

3.1 Study Purpose

The purpose of this Study was to determine whether any glare created from the Project will introduce novel ocular hazards for identified sensitive viewers adjacent to the Project site which consisted of nearby residences and adjacent roadways.

From Burns & McDonnell's experience on similar projects an appropriate threshold for determining novel ocular hazards for stationary observers, evaluated as OPs, that are not operating a motor vehicle must meet three criteria:

- There is a potential for glare ("yellow" glare) from the Project to be reflected to the observer, determined by the SGHAT.
- There exist no visual obstructions between the source of glare and the receiver of glare that would otherwise mitigate the ocular impact.
- The glare noted does not originate in the same or similar direction as the sun in the observer's field of view.

From Burns & McDonnell's experience on similar projects an appropriate threshold for determining ocular hazards for vehicle operators traveling on the roadways near the Project, evaluated as PRs, was based on the FAA Study where it was determined "…that any sources of glare at an airport may be potentially mitigated if the angle of the glare is greater than 25 degrees from the direction that the pilot is looking in" (Rogers, et al., 2015). Applying this standard to vehicles, this Study defines ocular hazards from glare to be glare within 25-degrees of the direction of vehicle travel and assumes vehicle operators properly operating the vehicle will be looking directly ahead in the direction of travel. Accordingly, four criteria must be met to determine if there are ocular hazards introduced by glare from the Project to vehicle operators on roadways adjacent to the Project site:

- There is a potential for glare ("yellow" glare) from the Project to be reflected to the adjacent roadways, determined by the SGHAT.
- There exist no visual obstructions between the source of glare and the receiver of glare that would otherwise mitigate the ocular impact.
- The glare received by a vehicle operator is within a 25-degree view angle in the normal direction of travel.

- The glare noted does not originate in the same or similar direction as the sun in the observer's field of view.

3.2 Observation Point and Array Outlines Generation

The array locations assessed were identified as the developable regions for the Project site by Burns & McDonnell. While not all of the arrays indicated may be developed by the Project, the geometric analysis performed in this Study evaluated for the entire area encompassed by the defined regions to allow for variations in the placement of the modules for the Project. The array ground heights were determined by the vertexes defining the array outline, plus the assumed average height above ground for a typical single-axis tracking system of six (6) feet for the geometric calculations.

The 202 OPs assessed were identified by their proximity to the Project site and consisted of residences that were numbered OP1 to OP202. The observer height was estimated to be six (6) feet above the ground height to model the eye height for a typical standing observer and were modeled to be 20 feet above ground height to model the eye height when an observer is on the second story of a building.

The seven (7) PRs assessed were identified by their proximity to the Project site and consisted of adjacent roadways that were numbered Route 1 to Route 7. The observer height was estimated to be 4 feet above the ground height to model the eye height for a typical observer operating a motor vehicle.

3.3 SGHAT Analysis

Once the receptors were defined, the array location and parameters were loaded into SGHAT and the geometric analysis was performed. The site consists of several arrays which were modeled as thirteen (13) separate polygons that outlined each array section numbed Array A to Array M. The SGHAT assesses glare for the entire area encompassed by the polygon indicated as being an array. Therefore, all areas that were indicated to be covered by modules, as well as the gaps between rows and areas representing access roads or otherwise undevelopable areas, were included in the geometric analysis. A summary of the parameters of the PV array and modules as input to the SGHAT are shown in Table 3-1 and the locations and numberings of the arrays is included for reference in Attachment 1.

Table 3-1: Parameters Used for PV Arrays and Modules

Array Type	Max Tracking Angle (degrees)	Resting Angle (degrees)	Array Azimuth (degrees)	Module Surface Material	Average Height Above Ground (ft)
Single-axis tracking	+/- 60	5	180	Smooth glass with anti-reflective coating	6

A resting angle less than the max tracking angle implies that the trackers utilize back-tracking technology, which, based on Burns & McDonnell's experience with similar projects, is typical for utility-scale sites using single-axis tracking racking when modeled in ForgeSolar. ForgeSolar utilizes a simplified model of back-tracking where the geometric calculations will evaluate the tracking angle of the modules to be at the resting angle when the position of the sun exceeds the defined max tracking angle. While this methodology may result in an overestimation of glare as modern back-tracking algorithms utilize a more gradual return to resting angle when the max tracking angle is exceeded, it can provide more conservative results for the potential impact on the surrounding area. For the analysis, the rest angle was set to five degrees as directed by Blossom Solar, LLC.

The SGHAT was utilized to determine if there was the potential for glare at each receptor, from where the potential glare would occur, and the ocular impact of glare. The results of the SGHAT analysis determined which receptors had the potential for glare but did not consider the potentially obstructed visibility of the glare from the receptor. The results of the SGHAT analysis were put into a summary table identifying the receptors that had the potential for glare from the Project array that would be causing the glare.

ForgeSolar is limited to performing a glare analysis on twenty (20) PV arrays and forty (40) OPs for each geometric analysis. Accordingly, for the thirteen (13) arrays, two-hundred and two (202) OPs, and seven (7) path receptors assessed for this Study, seven (7) separate geometric analysis calculations were performed to address this limitation and seven (7) reports with the results were generated. The full details of the parameters used in the different analysis and detailed results from the SGHAT can be provided upon request and for brevity are not attached to this report.

3.4 Line-of-Sight Analysis

The Project site was then screened with a desktop analysis utilizing the latest publicly available satellite imagery to determine LOS for any receptors that showed the potential to receive glare from the Project arrays. Each receptor was put into one of three categories:

- (V) visible, i.e., mostly unobstructed view of the arrays;
- (NV) not visible, i.e., one could not see the arrays due to obstructions; and
- (M) marginally visible, i.e., one could see some of the arrays, but the view was partially obstructed.

The results of the LOS analysis were then combined with the SGHAT analysis into a summary table indicating which receptors could potentially receive glare and that were visible and/or marginally visible. Those receptors that SGHAT indicated could potentially receive glare but were categorized as not visible were deemed to not adversely impact the vehicle operators or stationary observers. While evaluating the LOS for instances of glare, the direction of the glare relative to the sun for the receptor's field of view was also noted.

It is important to note that the LOS analysis is conservative because it considers only existing vegetation that may obstruct visibility. The Project includes a Preliminary Landscape Plan, the purpose of which is to install perimeter landscaping to supplement the existing topography and vegetation expressly for the purpose of reducing the visibility of the solar panels at adjacent homes and on area public roads and is not included in this analysis as a visual obstruction. Any physical obstructions between the source of glare and receiver will serve to reduce the size of glare in the field of view as well as the reflected/refracted irradiance received at the retina for an observer, which would accordingly reduce the potential for afterimage. Receptors that are indicated as experiencing some glare based solely on this LOS analysis using existing vegetation in fact may not experience such glare, or as much glare, once the supplemental landscaping is in place and especially once it has reached maturity.

4.0 RESULTS

4.1 SGHAT Results

A summary of results of the SGHAT analysis can be seen in Table 4-1 and Table 4-2 . If SGHAT reported receptors to have instances of both “green glare” and “yellow glare” over a calendar year, the “yellow glare” was recorded as it is a higher intensity which has a higher potential for causing afterimage in an observer. Full details of the glare analysis including the coordinates of each receptor, the location of glare on the arrays themselves if it were to occur, the estimated intensity of the glare, the configuration files for the simulation, etc. can be provided upon request and for brevity are not attached to this report.

It is important to note that the number of minutes of glare indicated are reported over the course of an entire calendar year. For instance, Instance #1 indicates 1,043 minutes of glare for a particular receptor from a particular portion of the solar array. This is 1,043 minutes over the course of a calendar year, which consists of 525,600 minutes. With a simplified calculation assuming half of that time being at night (262,800 of daytime minutes), the reported 1,043 minutes of glare would be less than 0.4% of the daylight hours in a calendar year.

Table 4-1: Glare Study Observation Point Results Summary

Observation Point	Result	Instance #
OP1	No potential for glare noted	
OP2	No potential for glare noted	
OP3	No potential for glare noted	
OP4	No potential for glare noted	
OP5	No potential for glare noted	
OP6	No potential for glare noted	
OP7	No potential for glare noted	
OP8	No potential for glare noted	
OP9	No potential for glare noted	
OP10	No potential for glare noted	
OP11	No potential for glare noted	
OP12	No potential for glare noted	
OP13	No potential for glare noted	
OP14	No potential for glare noted	
OP15	No potential for glare noted	
OP16	No potential for glare noted	
OP17	No potential for glare noted	

Observation Point	Result	Instance #
OP18	No potential for glare noted	
OP19	No potential for glare noted	
OP20	No potential for glare noted	
OP21	No potential for glare noted	
OP22	No potential for glare noted	
OP23	No potential for glare noted	
OP24	No potential for glare noted	
OP25	No potential for glare noted	
OP26	No potential for glare noted	
OP27	No potential for glare noted	
OP28	No potential for glare noted	
OP29	No potential for glare noted	
OP30	No potential for glare noted	
OP31	No potential for glare noted	
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OP33	No potential for glare noted	
OP34	No potential for glare noted	
OP35	No potential for glare noted	
OP36	No potential for glare noted	
OP37	No potential for glare noted	
OP38	No potential for glare noted	
OP39	No potential for glare noted	
OP40	No potential for glare noted	
OP41	No potential for glare noted	
OP42	No potential for glare noted	
OP43	No potential for glare noted	
OP44	No potential for glare noted	
OP45	No potential for glare noted	
OP46	No potential for glare noted	
OP47	No potential for glare noted	
OP48	No potential for glare noted	
OP49	No potential for glare noted	
OP50	No potential for glare noted	
OP51	No potential for glare noted	
OP52	No potential for glare noted	

Observation Point	Result	Instance #
OP53	No potential for glare noted	
OP54	No potential for glare noted	
OP55	No potential for glare noted	
OP56	No potential for glare noted	
OP57	No potential for glare noted	
OP58	No potential for glare noted	
OP59	No potential for glare noted	
OP60	No potential for glare noted	
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OP76	No potential for glare noted	
OP77	No potential for glare noted	
OP78	No potential for glare noted	
OP79	No potential for glare noted	
OP80	No potential for glare noted	
OP81	No potential for glare noted	
OP82	No potential for glare noted	
OP83	No potential for glare noted	
OP84	No potential for glare noted	
OP85	No potential for glare noted	
OP86	No potential for glare noted	
OP87	No potential for glare noted	

Observation Point	Result	Instance #
OP88	No potential for glare noted	
OP89	No potential for glare noted	
OP90	No potential for glare noted	
OP91	No potential for glare noted	
OP92	No potential for glare noted	
OP93	No potential for glare noted	
OP94	No potential for glare noted	
OP95	No potential for glare noted	
OP96	No potential for glare noted	
OP97	No potential for glare noted	
OP98	No potential for glare noted	
OP99	No potential for glare noted	
OP100	No potential for glare noted	
OP101	No potential for glare noted	
OP102	No potential for glare noted	
OP103	No potential for glare noted	
OP104	No potential for glare noted	
OP105	No potential for glare noted	
OP106	No potential for glare noted	
OP107	No potential for glare noted	
OP108	No potential for glare noted	
OP109	No potential for glare noted	
OP110	No potential for glare noted	
OP111	No potential for glare noted	
OP112	No potential for glare noted	
OP113	No potential for glare noted	
OP114	No potential for glare noted	
OP115	No potential for glare noted	
OP116	No potential for glare noted	
OP117	No potential for glare noted	
OP118	No potential for glare noted	
OP119	1,043 minutes of “yellow” glare annually from Array M	1
OP120	3,290 minutes of “yellow” glare annually from Array M	2
OP121	No potential for glare noted	
OP122	No potential for glare noted	

Observation Point	Result	Instance #
OP123	No potential for glare noted	
OP124	No potential for glare noted	
OP125	No potential for glare noted	
OP126	No potential for glare noted	
OP127	898 minutes of "yellow" glare annually from Array J	3
OP128	885 minutes of "yellow" glare annually from Array J	4
OP129	No potential for glare noted	
OP130	No potential for glare noted	
OP131	No potential for glare noted	
OP132	No potential for glare noted	
OP133	No potential for glare noted	
OP134	No potential for glare noted	
OP135	No potential for glare noted	
OP136	329 minutes of "yellow" glare annually from Array M	5
OP137	No potential for glare noted	
OP138	27 minutes of "yellow" glare annually from Array M	6
OP139	No potential for glare noted	
OP140	No potential for glare noted	
OP141	No potential for glare noted	
OP142	67 minutes of "yellow" glare annually from Array J	7
OP143	No potential for glare noted	
OP144	No potential for glare noted	
OP145	1,042 minutes of "yellow" glare annually from Array M	8
OP146	2,747 minutes of "yellow" glare annually from Array M	9
OP147	No potential for glare noted	
OP148	No potential for glare noted	
OP149	1,578 minutes of "yellow" glare annually from Array M	10
OP150	5,041 minutes of "yellow" glare annually from Array M	11
OP151	No potential for glare noted	
OP152	6 minutes of "yellow" glare annually from Array M	12
OP153	No potential for glare noted	
OP154	No potential for glare noted	
OP155	No potential for glare noted	
OP156	No potential for glare noted	
OP157	No potential for glare noted	

Observation Point	Result	Instance #
OP158	No potential for glare noted	
OP159	No potential for glare noted	
OP160	1,461 minutes of “yellow” glare annually from Array M	13
OP161	No potential for glare noted	
OP162	2,638 minutes of “yellow” glare annually from Array M	14
OP163	No potential for glare noted	
OP164	No potential for glare noted	
OP165	No potential for glare noted	
OP166	1999 minutes of “yellow” glare annually from Array M	15
OP167	No potential for glare noted	
OP168	1,939 minutes of “yellow” glare annually from Array M	16
OP169	No potential for glare noted	
OP170	14 minutes of “yellow” glare annually from Array M	17
OP171	No potential for glare noted	
OP172	No potential for glare noted	
OP173	No potential for glare noted	
OP174	No potential for glare noted	
OP175	No potential for glare noted	
OP176	No potential for glare noted	
OP177	No potential for glare noted	
OP178	107 minutes of “yellow” glare annually from Array M	18
OP179	No potential for glare noted	
OP180	No potential for glare noted	
OP181	No potential for glare noted	
OP182	No potential for glare noted	
OP183	No potential for glare noted	
OP184	No potential for glare noted	
OP185	No potential for glare noted	
OP186	No potential for glare noted	
OP187	No potential for glare noted	
OP188	No potential for glare noted	
OP189	No potential for glare noted	
OP190	No potential for glare noted	
OP191	No potential for glare noted	
OP192	No potential for glare noted	

Observation Point	Result	Instance #
OP193	No potential for glare noted	
OP194	No potential for glare noted	
OP195	No potential for glare noted	
OP196	No potential for glare noted	
OP197	No potential for glare noted	
OP198	No potential for glare noted	
OP199	No potential for glare noted	
OP200	No potential for glare noted	
OP201	No potential for glare noted	
OP202	No potential for glare noted	

Table 4-2: Glare Study Roadway Path Receptor Results Summary

Path Receptor	Result	Instance #
Route 1	No potential for glare noted	
Route 2	No potential for glare noted	
Route 3	No potential for glare noted	
Route 4	No potential for glare noted	
Route 5	1,295 minutes of "yellow" glare annually from Array M	19
Route 6	4,663 minutes of "yellow" glare annually from Array M	20
Route 7	No potential for glare noted	

4.2 Line-of-Sight Analysis Results

Following the results of the SGHAT analysis, there were twenty (20) instances of potential glare noted. The sources of glare on the array and the position of the receptor were then evaluated for utilizing the latest publicly available satellite imagery to determine LOS for any receptors that showed the potential to receive glare from the Project arrays. While evaluating the LOS for instances of glare, the direction of the glare relative to the sun for the receptor's field of view was also noted. Each receptor was put into one of three categories:

- (V) visible, i.e., mostly unobstructed view of the arrays;
- (NV) not visible, i.e., one could not see the arrays due to obstructions; and
- (M) marginally visible, i.e., one could see some of the arrays, but the view was partially obstructed.

Table 4-3: Line-of-Sight Analysis Results

Instance Number	LOS Categorization	Notes
1	V	OP119, same location as OP120 but at 6ft elevation, glare from NE corner of Array M, scattered existing vegetation for visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
2	V	OP120, same location as OP119 but at 20ft elevation, glare from NE corner of Array M, scattered existing vegetation for visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
3	V	OP127, duplicate of OP128, glare from E edge of Array J, scattered existing vegetation for visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
4	V	OP128, duplicate of OP127, glare from E edge of Array J, scattered existing vegetation for visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
5	M	OP136, glare originating from corner of Array M that is closest to OP to the SW, ~100ft of existing and mature vegetation and structures to serve as visual obstruction, glare originating from similar direction as the sun from the observer perspective during sunset hours
6	M	OP138, glare originating from corner of Array M that is closest to OP to the SW, ~ 100ft of existing and mature vegetation and structures to serve as visual obstruction, glare originating from similar direction as the sun from the observer perspective during sunset hours
7	V	OP142, glare originating from corner of Array J that is closest to OP to the NW, scattered existing vegetation for visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
8	M	OP145, same location as OP146 but at 6ft elevation, glare originating from corner of Array M that is closest to OP to the SW, ~ 100ft of existing and mature vegetation and structures to serve as visual obstruction, glare originating from similar direction as the sun from the observer perspective during sunset hours
9	M	OP146, same location as OP145 but at 20ft elevation, glare originating from corner of Array M that is closest to OP to the SW, ~ 100ft of existing and mature vegetation and structures to serve as visual obstruction, glare originating from similar direction as the sun from the observer perspective during sunset hours
10	M	OP149, same location as OP150 but at 6ft elevation, glare originating from corner of Array M that is closest to OP to the SW, ~ 100ft of existing and mature vegetation and structures to serve as visual obstruction, glare originating from similar direction as the sun from the observer perspective during sunset hours

Instance Number	LOS Categorization	Notes
11	M	OP150, same location as OP149 but at 20ft elevation, glare originating from corner of Array M that is closest to OP to the SW, ~ 100ft of existing and mature vegetation and structures to serve as visual obstruction, glare originating from similar direction as the sun from the observer perspective during sunset hours
12	NV	OP152, glare originating from corner of Array M that is closest to OP to the SW, greater than 100ft of existing and mature vegetation and structures to serve as visual obstruction
13	V	OP160, duplicate of OP162, glare originating from edge of Array M that is closest to OP to the W, no visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
14	V	OP162, duplicate of OP160, glare originating from edge of Array M that is closest to OP to the W, no visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
15	V	OP166, duplicate of OP168, glare originating from edge of Array M that is closest to OP to the W, no visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
16	V	OP168, duplicate of OP166, glare originating from edge of Array M that is closest to OP to the W, no visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
17	V	OP170 glare originating from corner of Array M that is closest to OP to the NW, no visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours
18	M	OP178 glare originating from corner of Array M to the NE of the OP, ~ 100ft of existing and mature vegetation to serve as visual obstruction, glare originating from similar direction as the sun from the observer perspective during sunrise hours
19	NV	Route 5, glare originating from nearest corner of Array M to the NW of westbound traffic on State Road 61 approach to OH-309, greater than 100ft of existing and mature vegetation to serve as visual obstruction. Furthermore, glare analysis results indicate glare is originating outside of areas where PV modules are intended to be placed, glare originating from similar direction as the sun from the observer perspective during sunset hours
20	V	Route 6 glare originating from nearest corner of Array M to the NW of westbound traffic for stretch of OH-288 between State Road 61 and OH-309, no visual screening, glare originating from similar direction as the sun from the observer perspective during sunset hours

4.3 Combined Results Discussion

Of the twenty (20) instances of the potential for glare noted eleven (11) were noted to have no or minimal existing visual obstructions that may mitigate or eliminate the glare, seven (7) were noted to have existing vegetations and structures that may mitigate or potentially eliminate the glare that was noted, and two (2) were noted to have notable amounts of existing visual obstructions that would serve as a visual obstruction and likely eliminate the impacts of glare.

It was noted for all instances of glare that the glare was occurring during sunrise and sunset hours during periods of back-tracking. This is important to note as the glare would be originating from a similar direction as the sun during these periods. The reflected/refracted glare in the noted instances would be in the observer's field of view in a similar direction as the sun. Accordingly, the observer would be expecting the light from the sun already and the reflected/refracted light would not introduce a novel ocular hazard. While the reflected/refracted glare would be significantly lower magnitude than the sunlight coming from a similar direction and at the same time, visual screening in locations between the observers and the source of the glare on the instances that are noted would serve to block reflected/refracted glare and mitigate impacts.

5.0 CONCLUSION

Burns & McDonnell used the Solar Glare Hazard Analysis Tool licensed to ForgeSolar and the latest available satellite imagery in a desktop analysis to evaluate the potential for ocular hazard from glare in the area adjacent to the site for the Blossom Solar Project located in Morrow County, Ohio. The following conclusions from that evaluation are noted by Burns & McDonnell:

(i) The OPs and PRs that were assessed represent nearby residences and roadways as potential sensitive receptors that are adjacent to the Project site based on Burns & McDonnell's experience with similar projects.

(ii) For the two-hundred and two (202) OPs assessed representing nearby residences there was eighteen (18) instances of glare with the potential for afterimage ("yellow" glare) noted.

a. Substantial existing vegetation exists for one (1) instance that will likely serve as a consistent visual screening to eliminate the impacts of glare.

b. Existing vegetation exists for seven (7) instances that will potentially serve to mitigate if not eliminate the potential for glare.

c. No substantial existing visual obstructions for eleven (11) that may mitigate or eliminate the potential for glare.

d. The glare in all instances occurs during periods of back-tracking and in a similar direction as the sun for the observer and are not considered to be a novel ocular hazard introduced by the Project.

(iii) For the seven (7) PRs assessed representing nearby roadways there were two (2) instances of glare with the potential for afterimage ("yellow" glare) noted.

a. Substantial existing vegetation exists for one (1) instance that will likely serve as a consistent visual screening to eliminate the impacts of glare.

b. No substantial existing visual obstructions for one (1) instance that may mitigate or eliminate the potential for glare.

c. The glare in all instances occurs during periods of back-tracking and in a similar direction as the sun for the observer and are not considered to be a novel ocular hazard introduced by the Project.

6.0 REFERENCES

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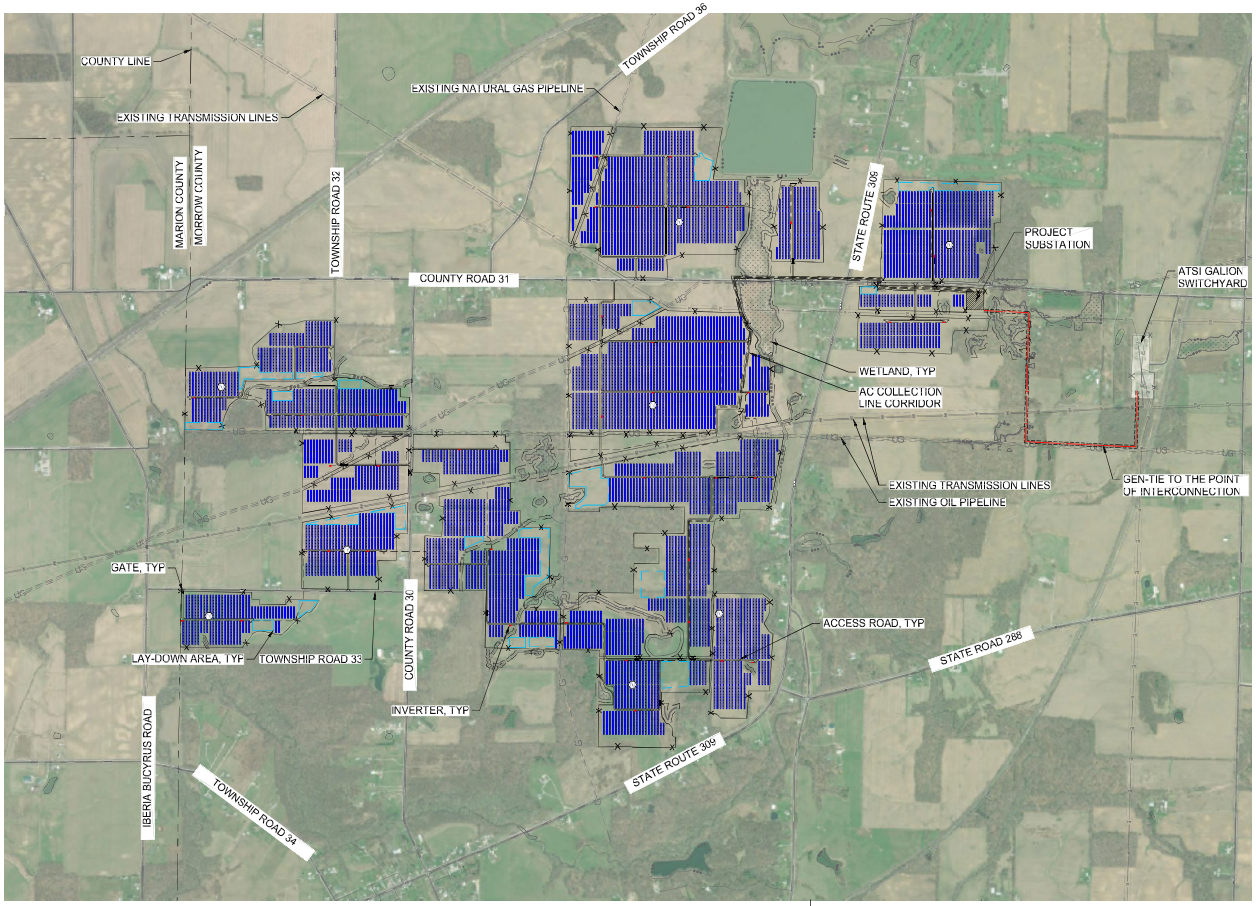
ATTACHMENT 1 – PROJECT OVERVIEW

Attachment 3



GENERAL ARRANGEMENT
0 1000' 2000'
SCALE IN FEET

NORTH

LEGEND:

- PROPOSED FENCE
- ACCESS ROAD
- LAY-DOWN AREA
- WETLAND
- STREAM
- EXISTING TRANSMISSION/DISTRIBUTION LINE
- PROPOSED COLLECTION SYSTEM LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING OIL PIPELINE
- EXISTING NATURAL GAS PIPELINE
- INVERTER
- COUNTY LINE

SETBACKS	
PROPERTY LINE TO FENCELINE	25' MIN.
NEIGHBORING RESIDENCE TO FENCELINE	250' MIN.
JURISDICTIONAL WATERWAY OR WETLAND TO FENCELINE	25' MIN.
EXISTING ROAD R-O-W TO FENCELINE	25' MIN.
NEIGHBORING RESIDENCES TO INVERTERS	500' MIN.

SYSTEM DESCRIPTION (SITE TOTAL)	
POI CAPACITY (AC)	144.0 MW
INVERTER NAMEPLATE CAPACITY	160.0 MW
SOLAR CAPACITY (DC)	159.5 MW
DC:AC RATIO (@ POI)	1.11
AC COLLECTION SYSTEM VOLTAGE	34.5 kV
DC SYSTEM VOLTAGE	1,500 V
TOTAL MODULES	295,360
MODULES PER STRING	26
AVERAGE STRINGS PER INVERTER	284
TOTAL INVERTER SKIDS	40

DESIGN PARAMETERS	
GROUND COVER RATIO	31%
RACKING	SINGLE AXIS TRACKER
ROW TO ROW SPACING	50.98'
NO. OF 4-STRING TRACKERS	2,840

MODULE PARAMETERS	
MANUFACTURER	LONGI
MODEL NUMBER	LR5-72HPH-540M
MODULE WATTAGE	540W

PV INVERTER PARAMETERS	
MANUFACTURER	SMA
MODEL NUMBER	SUNNY CENTRAL 4000 UP-US
INVERTER NAMEPLATE RATING	4,000 kVA

NOTES:

1. THIS DRAWING IS CONCEPTUAL IN NATURE AND FOR PLANNING PURPOSES ONLY.
2. THIS DRAWING REPRESENTS ONE PROPOSED LAYOUT AND IS SUBJECT TO CHANGE BASED ON DETAILED DESIGN, AS WELL AS ACTUAL SITE CONDITIONS.
3. SITE TO INCLUDE 16' ACCESS ROADS.
4. TURNING RADIUS ON ROADS TO BE 35' TYPICAL.

KEYED NOTES:

1. SOLAR MEASUREMENT STATION

FOR PERMITTING PURPOSES ONLY

no.	date	by	ckd	description
0	05/13/22	PSD	-	ISSUED FOR PERMIT

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.

designed P. DURKEE | detailed D. KOPER

MORROW COUNTY, OH

BLOSSOM SOLAR PROJECT
OVERALL GENERAL ARRANGEMENT

project 132219 | contract -

drawing CS100 | rev. 0

sheet - of - sheets

file 132219CS100.dwg

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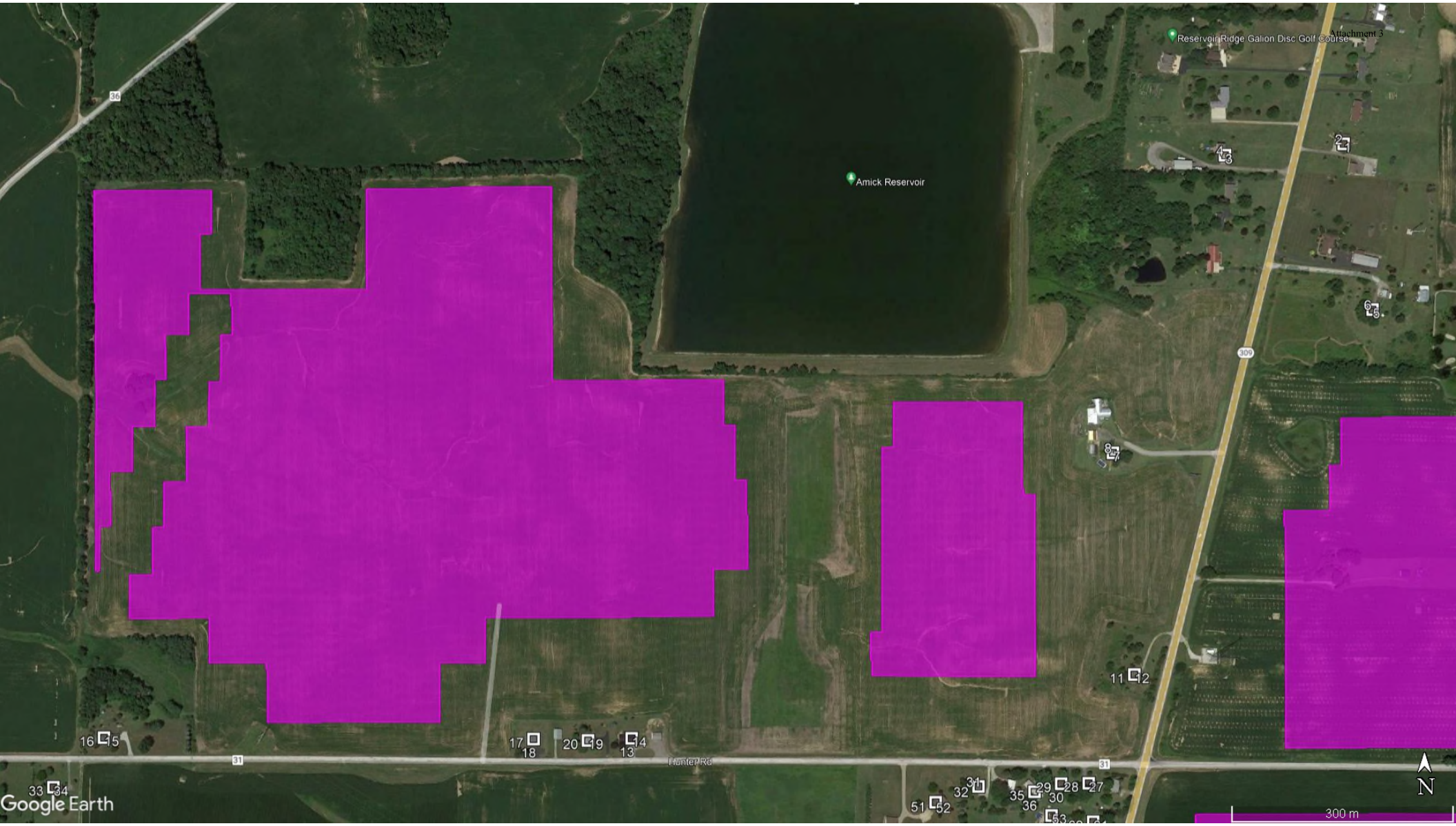
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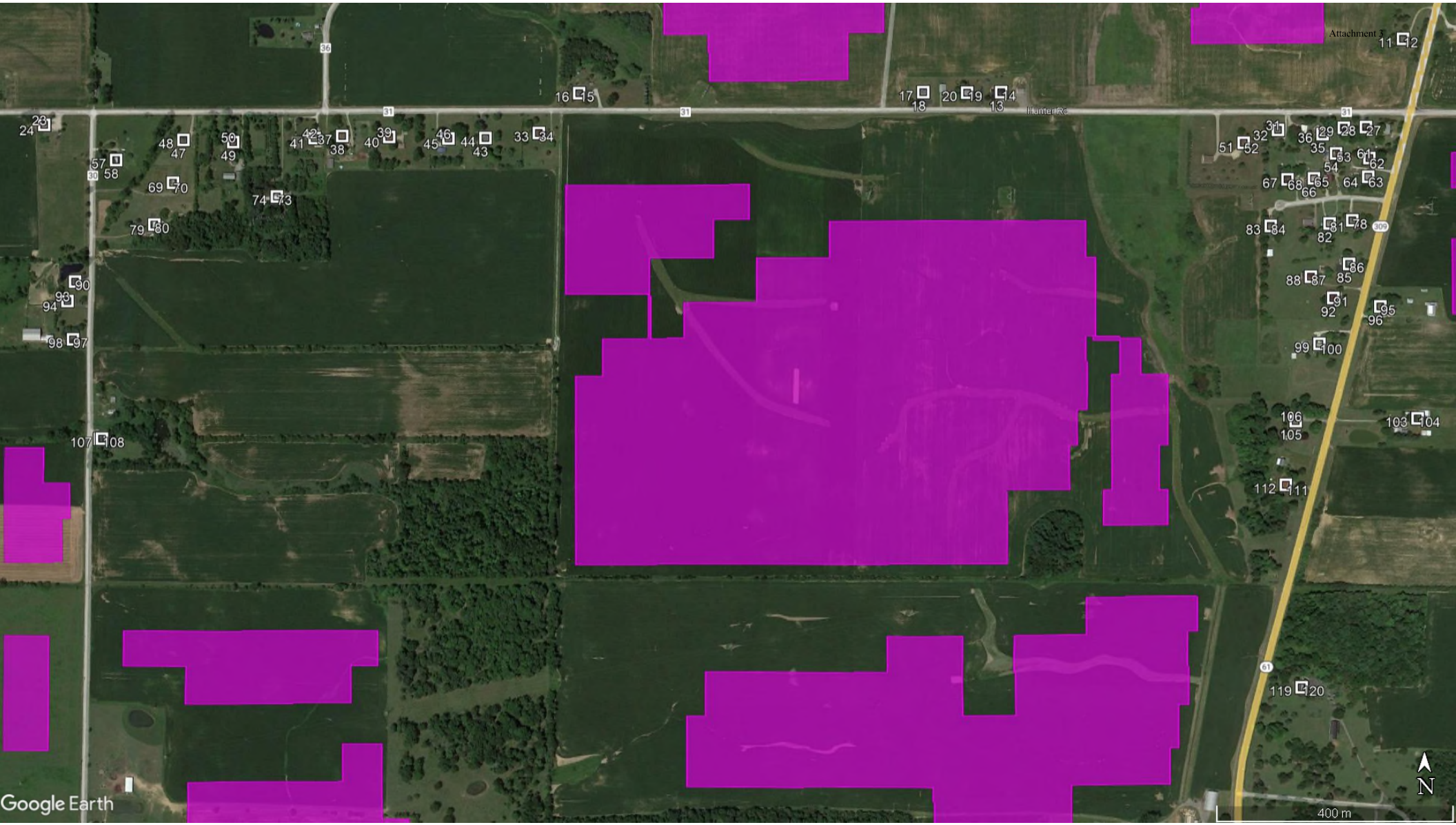
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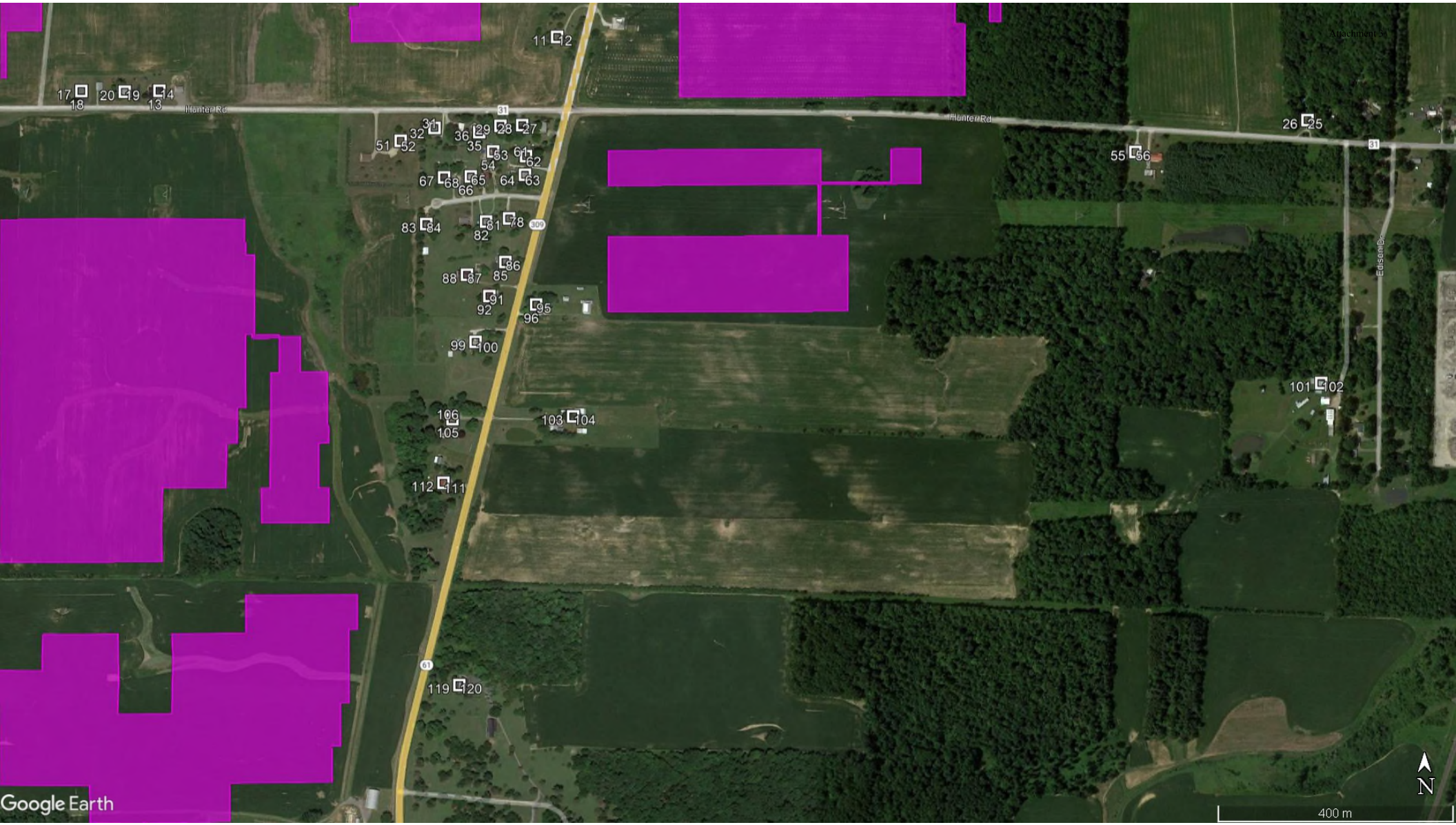
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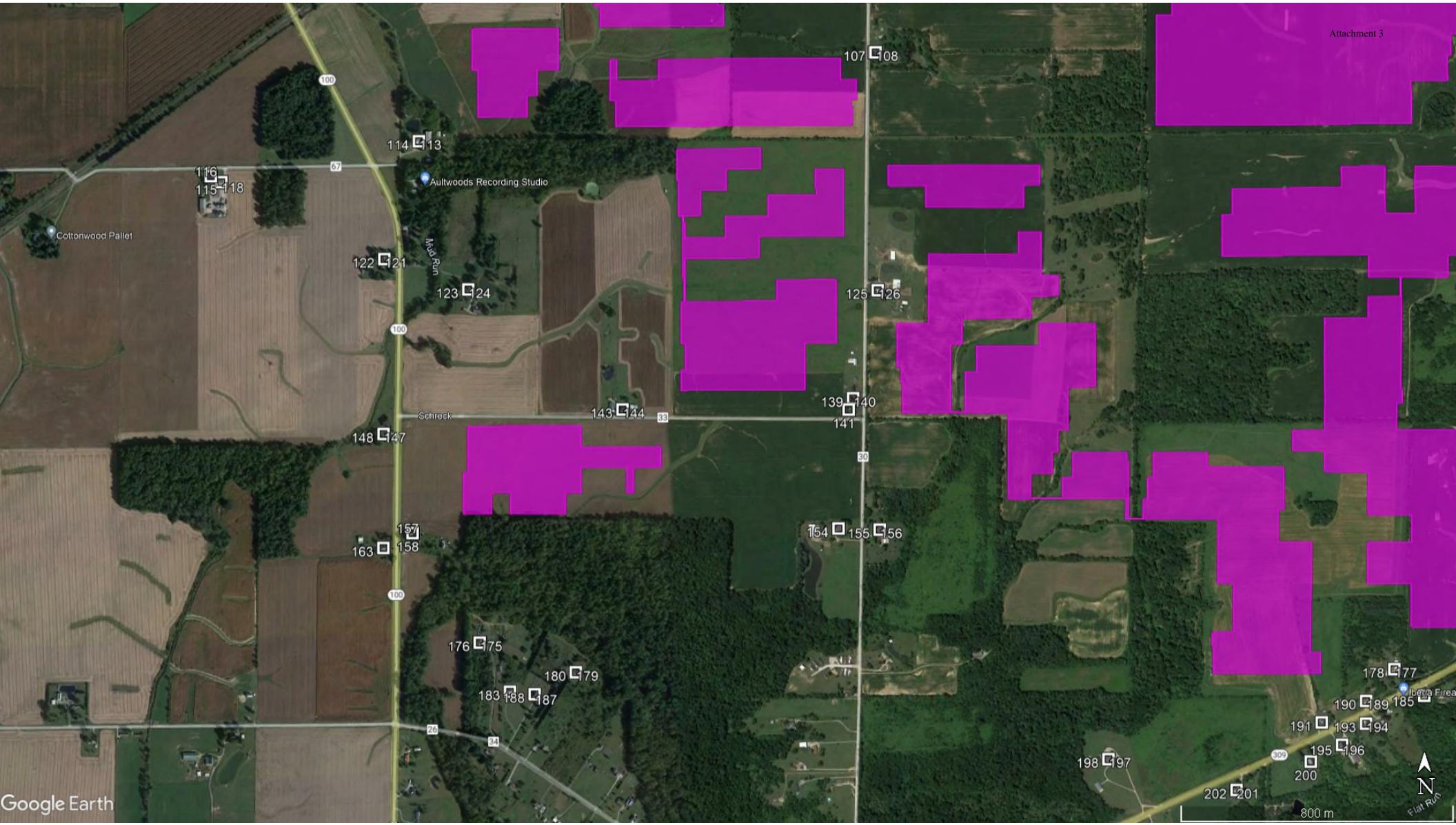
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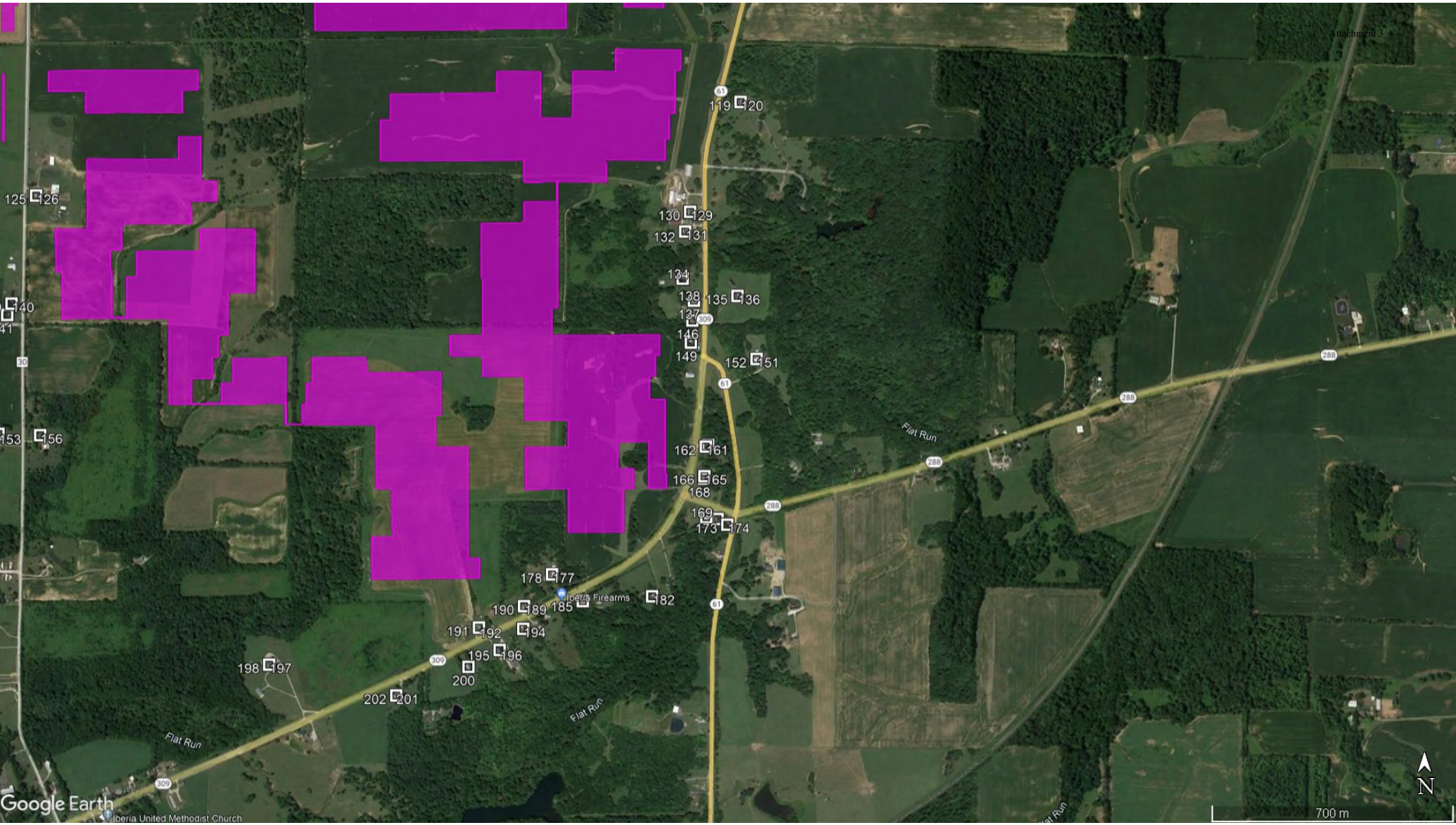
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Flat Run
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Google Earth
Iberia United Methodist Church
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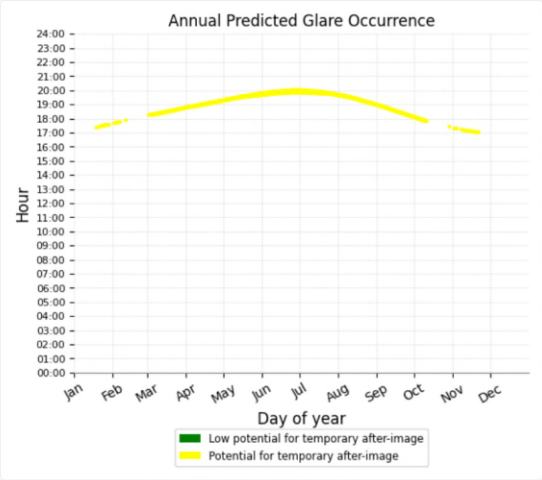
ATTACHMENT 2 – GLARE INSTANCE PLOTS

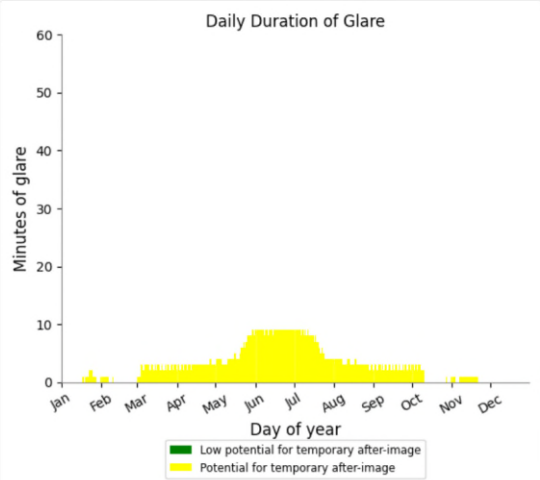
Glare Instance 1

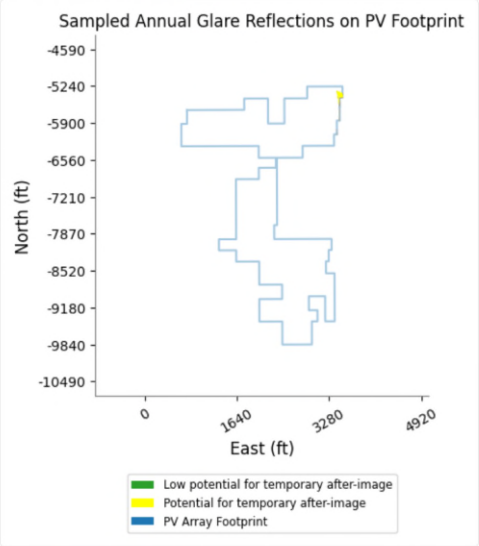
PV Array M - OP Receptor (OP 119)

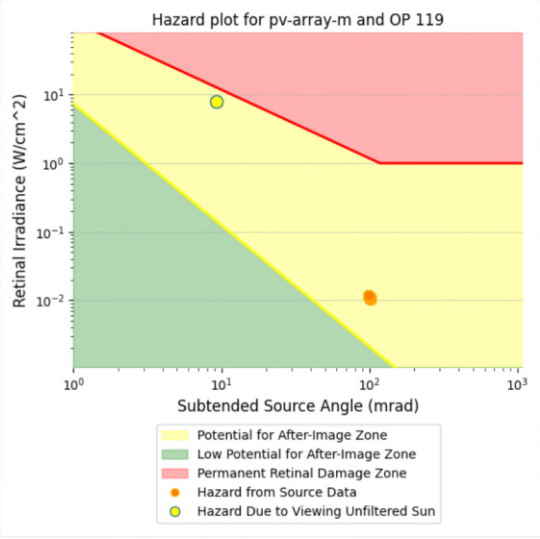
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,043 minutes of "yellow" glare with potential to cause temporary after-image.







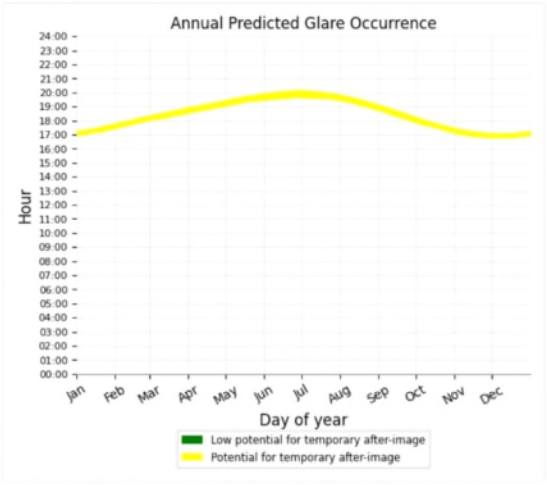


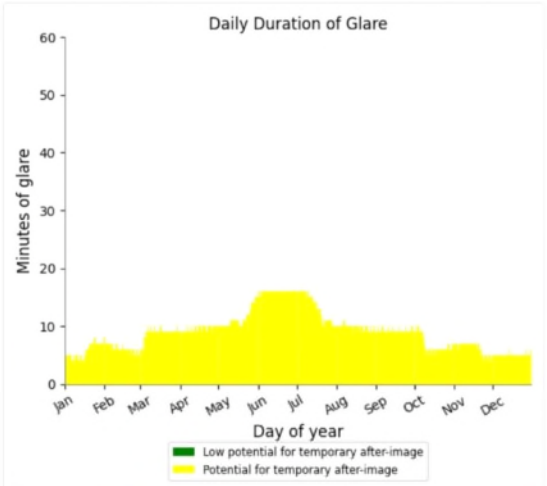
Glare Instance 2

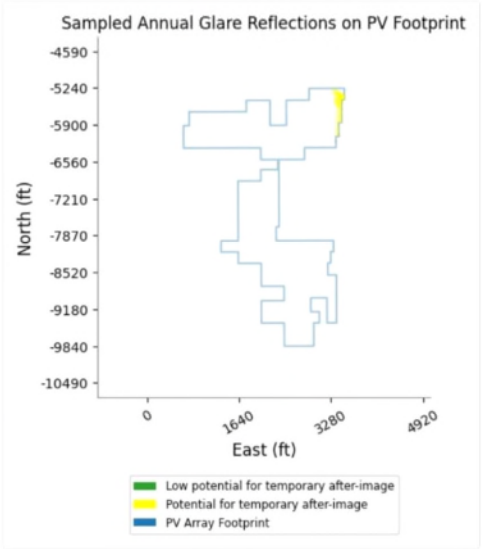
PV Array M - OP Receptor (OP 120)

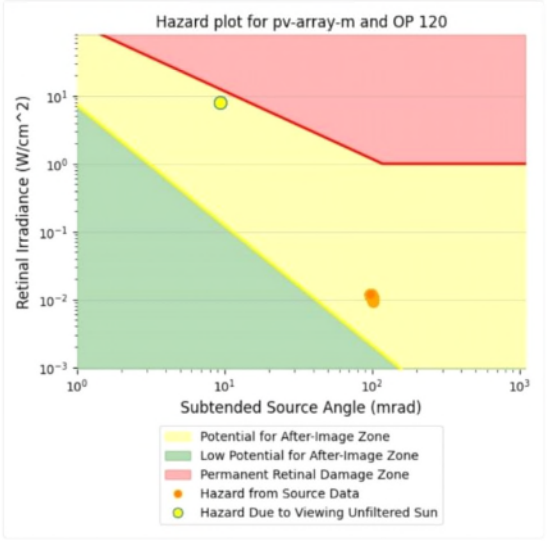
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 3,290 minutes of "yellow" glare with potential to cause temporary after-image.







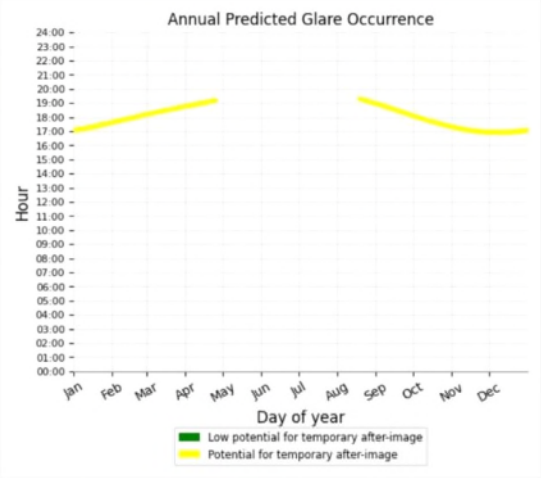


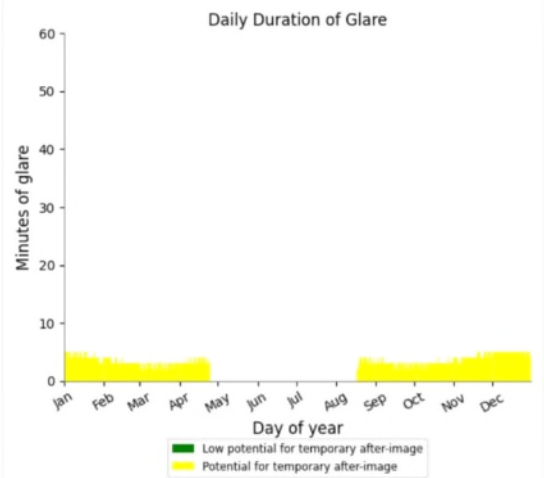
Glare Instance 3

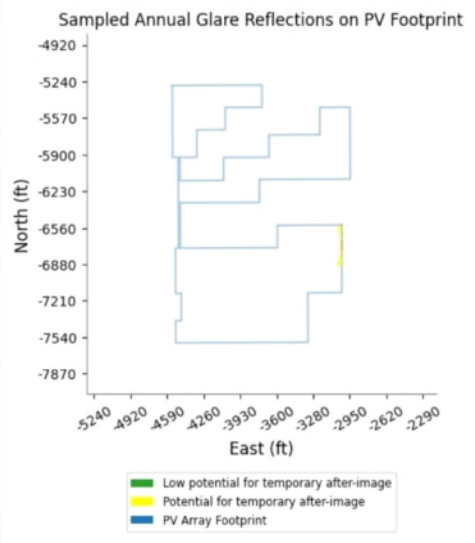
PV Array J - OP Receptor (OP 127)

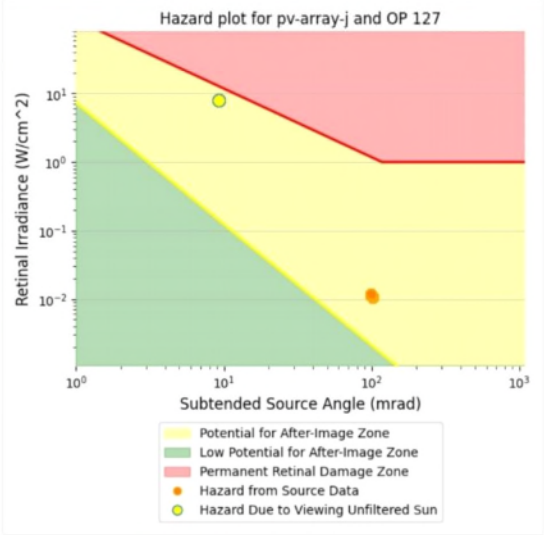
PV array is expected to produce the following glare for receptors at this location:

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







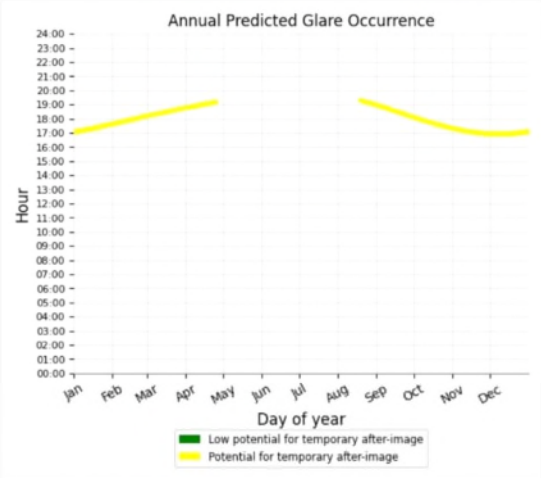


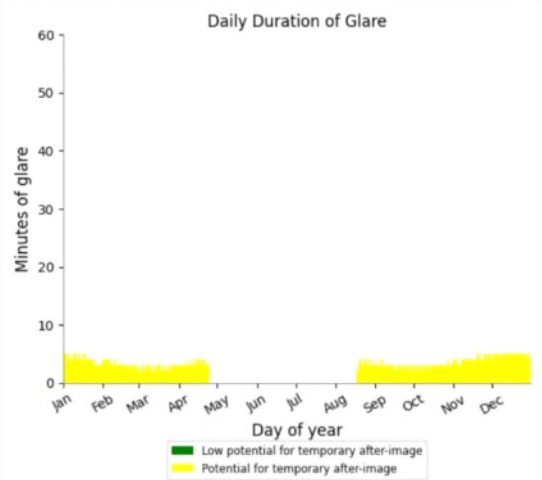
Glare Instance 4

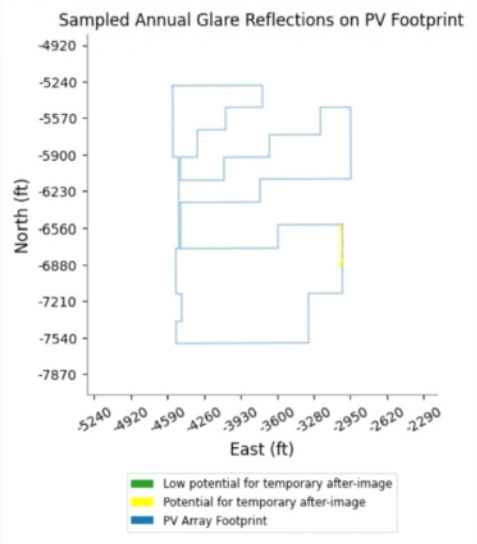
PV Array J - OP Receptor (OP 128)

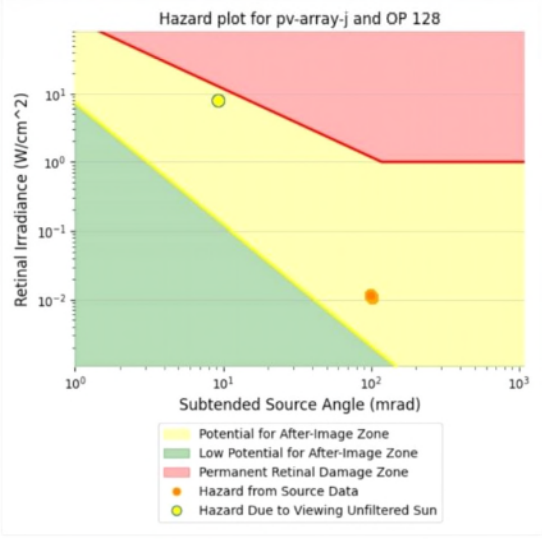
PV array is expected to produce the following glare for receptors at this location:

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







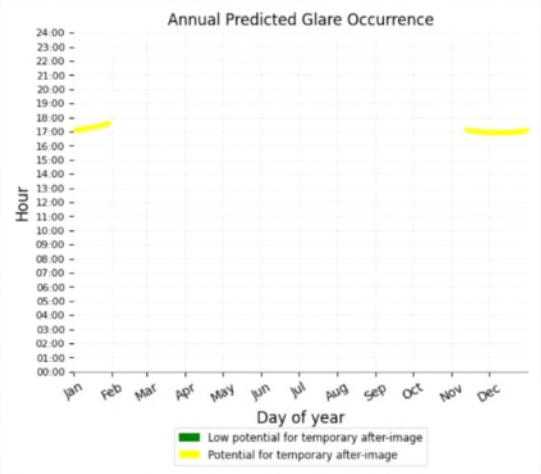


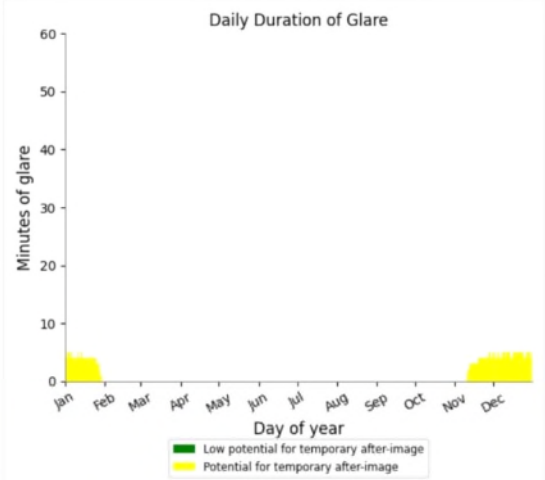
Glare Instance 5

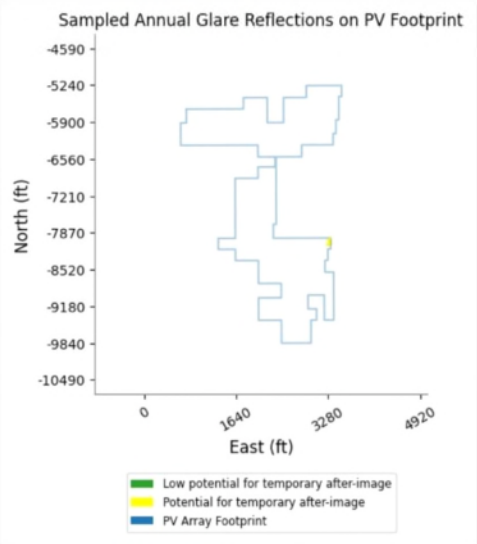
PV Array M - OP Receptor (OP 136)

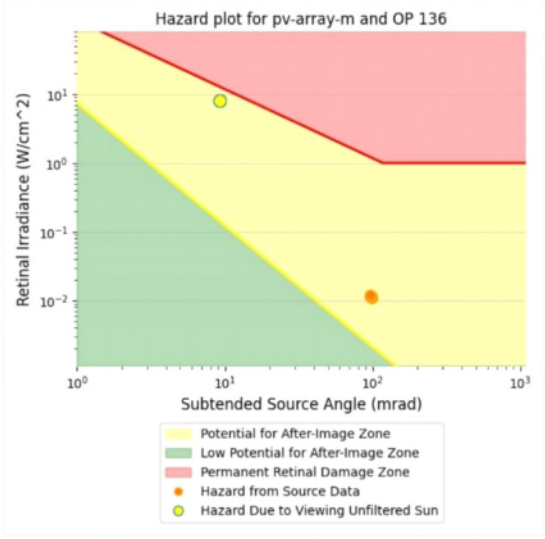
PV array is expected to produce the following glare for receptors at this location:

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







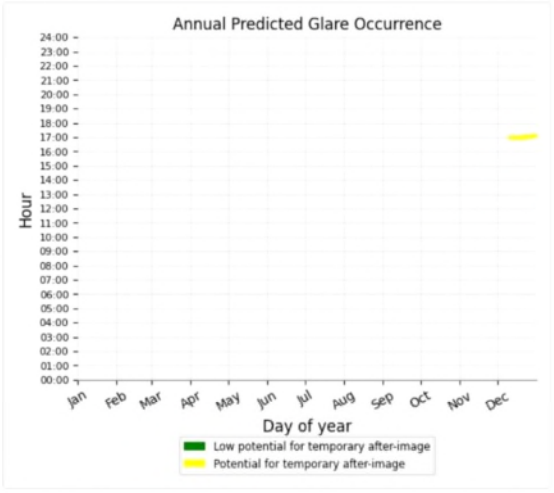


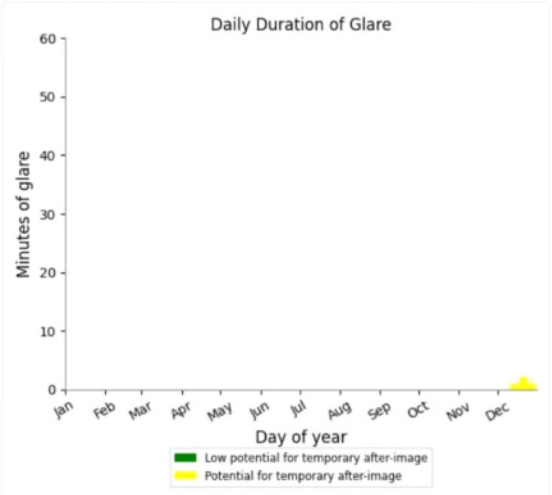
Glare Instance 6

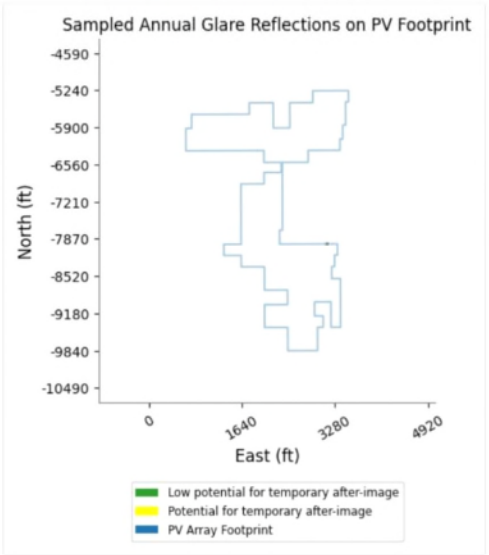
PV Array M - OP Receptor (OP 138)

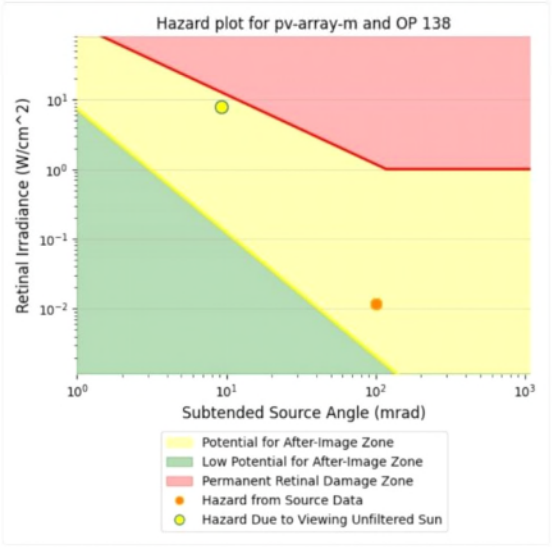
PV array is expected to produce the following glare for receptors at this location:

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







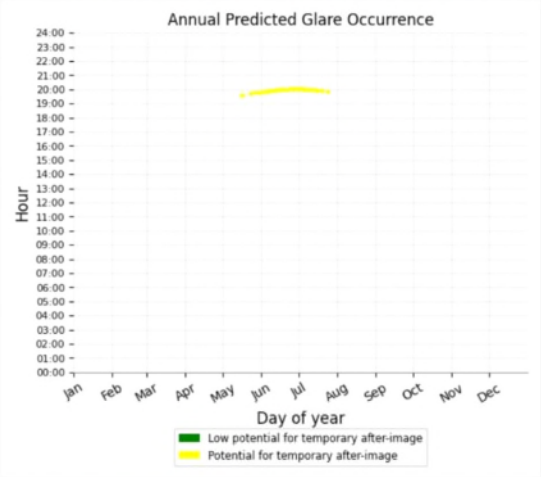


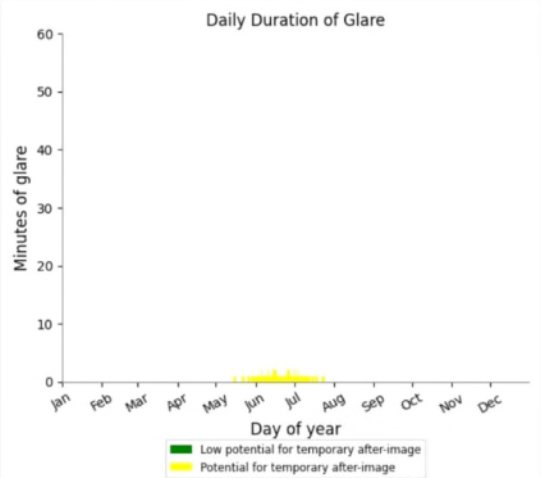
Glare Instance 7

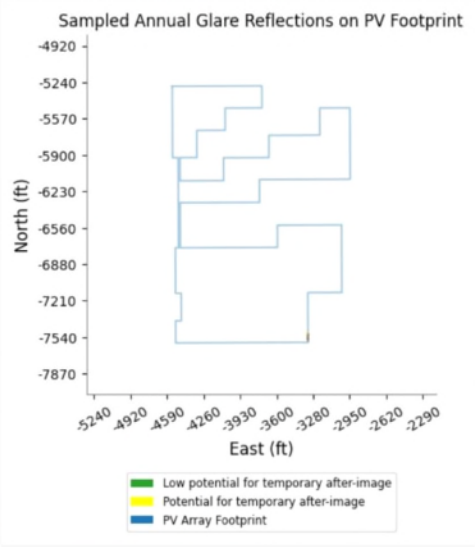
PV Array J - OP Receptor (OP 142)

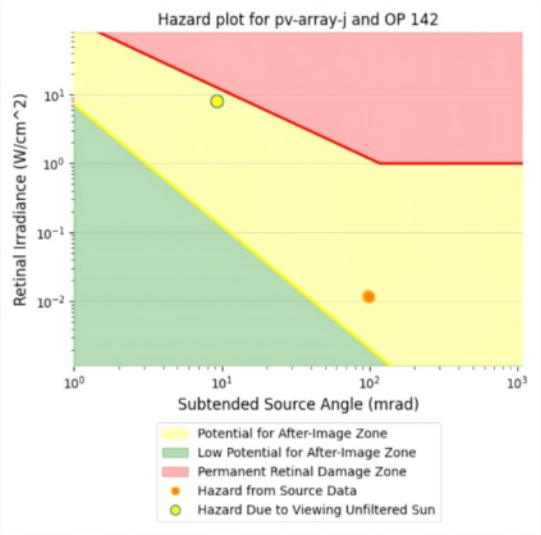
PV array is expected to produce the following glare for receptors at this location:

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







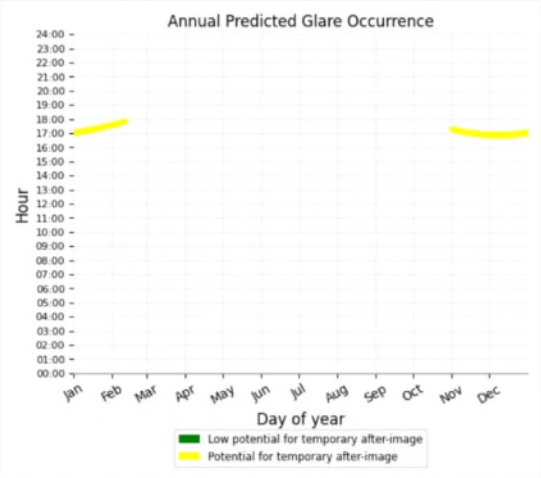


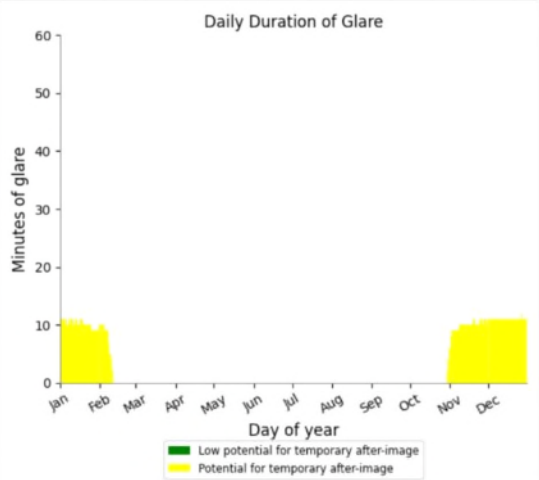
Glare Instance 8

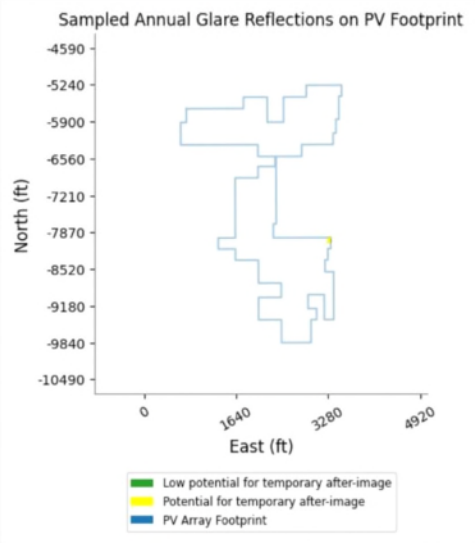
PV Array M - OP Receptor (OP 145)

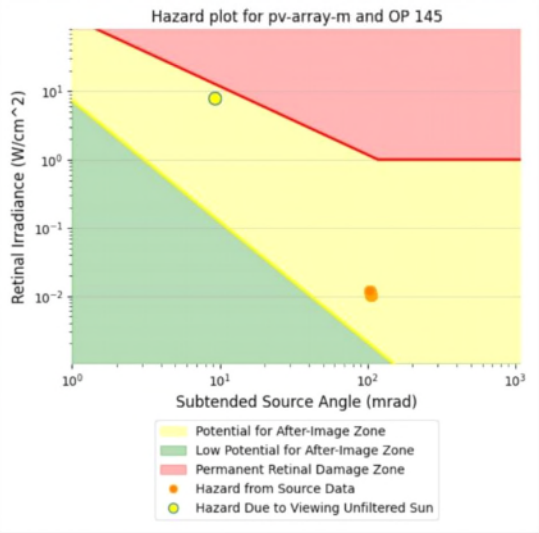
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,042 minutes of "yellow" glare with potential to cause temporary after-image.







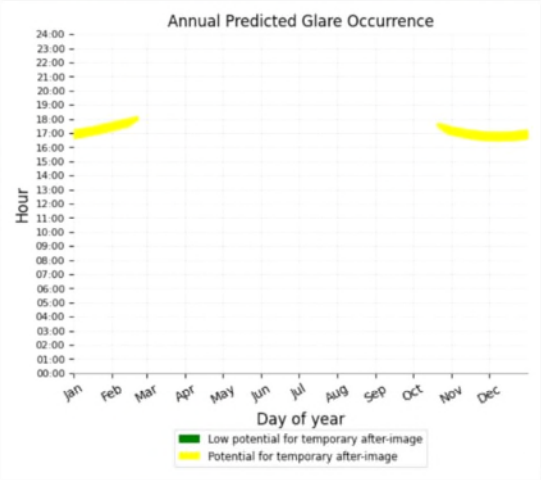


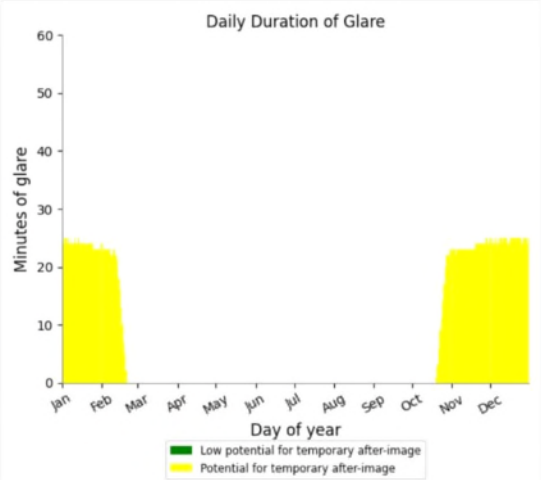
Glare Instance 9

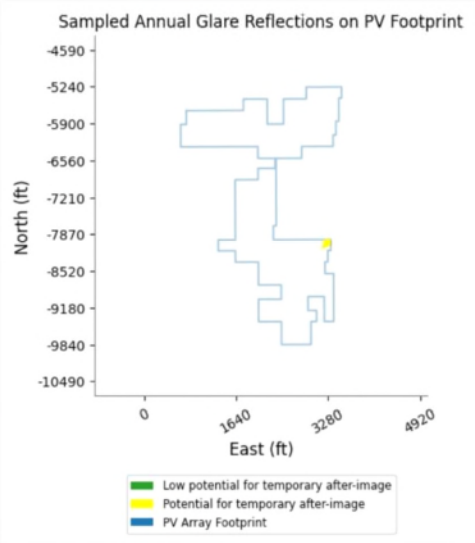
PV Array M - OP Receptor (OP 146)

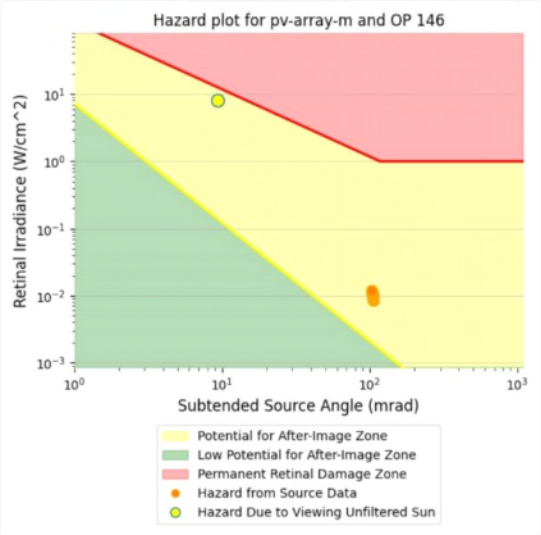
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,747 minutes of "yellow" glare with potential to cause temporary after-image.







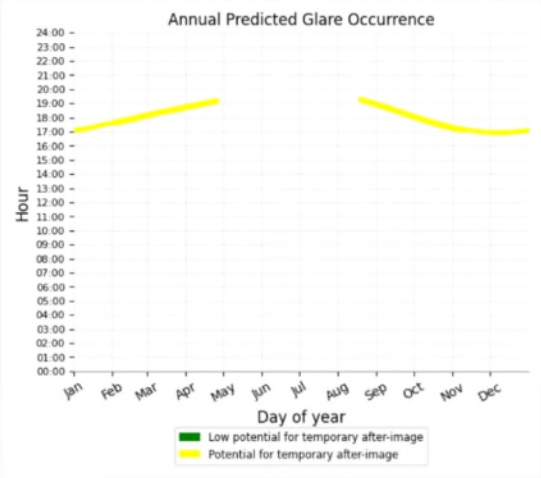


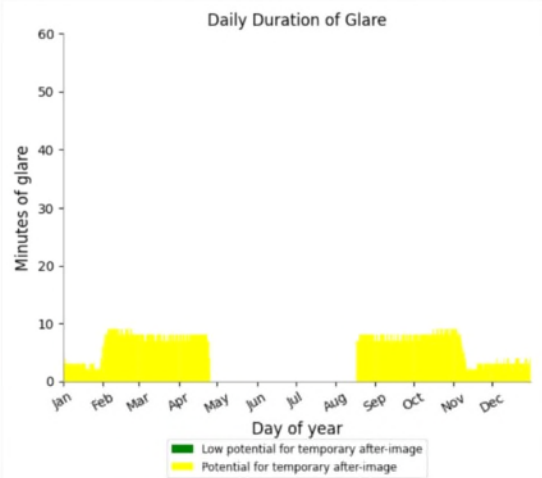
Glare Instance 10

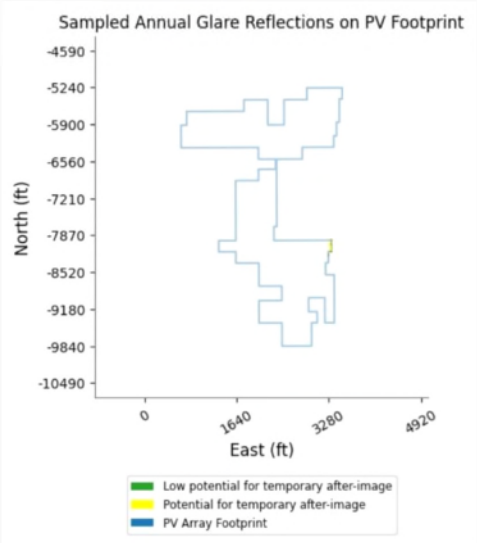
PV Array M - OP Receptor (OP 149)

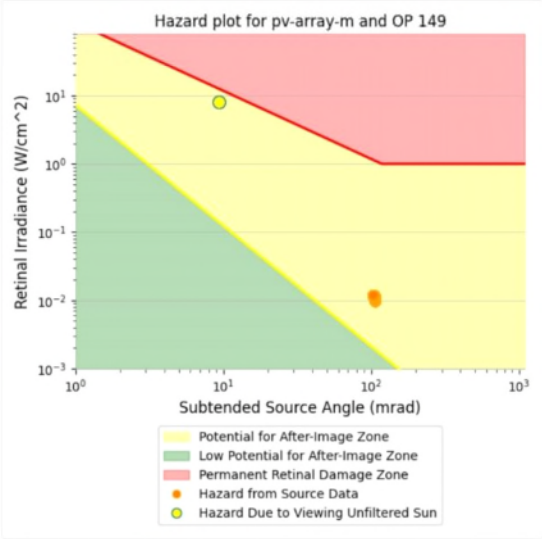
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,578 minutes of "yellow" glare with potential to cause temporary after-image.







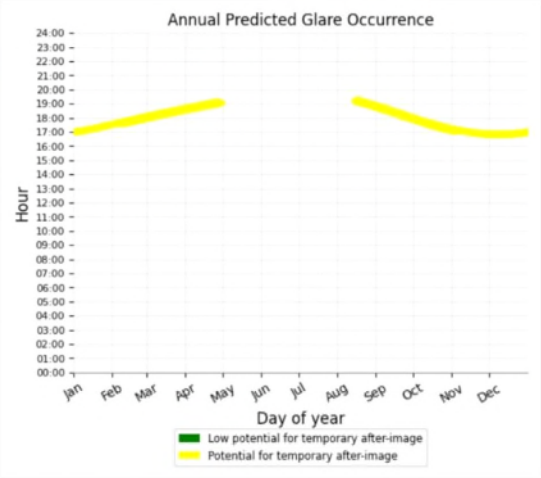


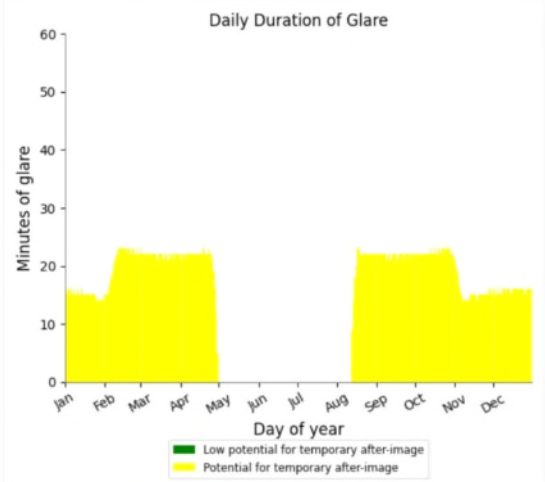
Glare Instance 11

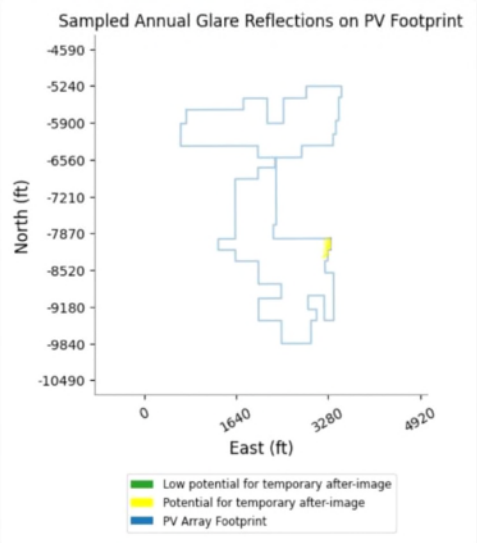
PV Array M - OP Receptor (OP 150)

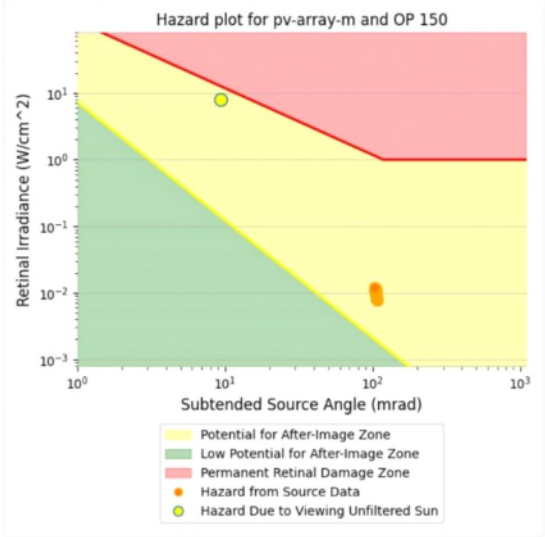
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 5,041 minutes of "yellow" glare with potential to cause temporary after-image.







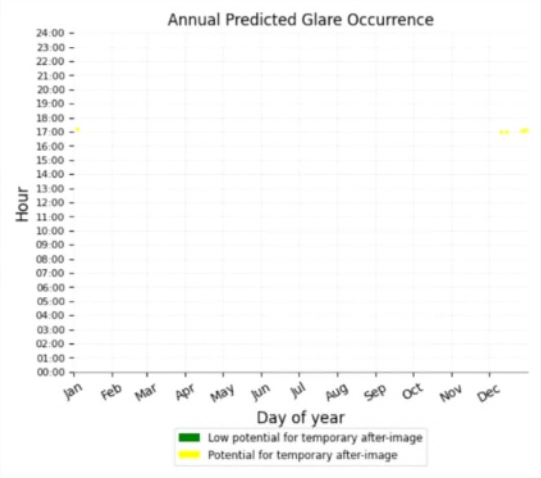


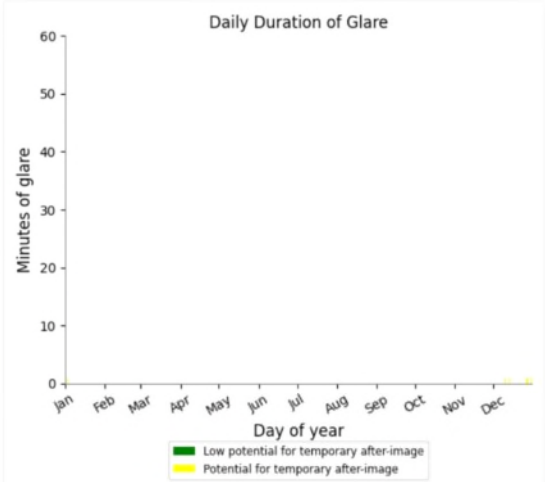
Glare Instance 12

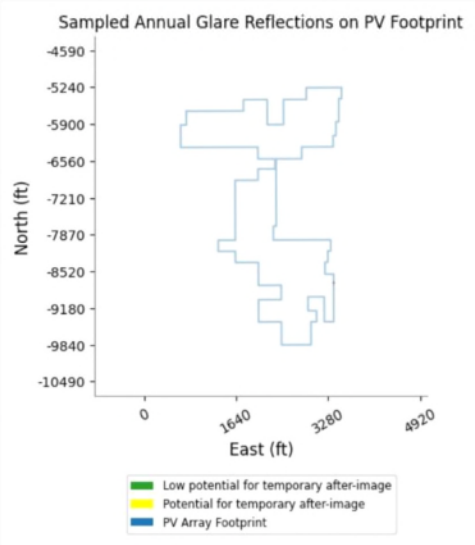
PV Array M - OP Receptor (OP 152)

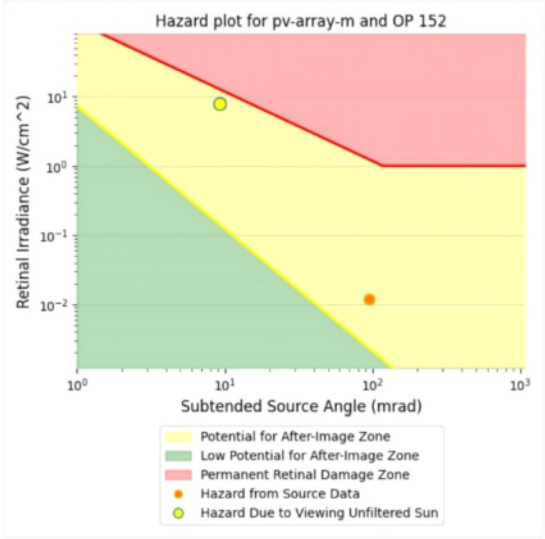
PV array is expected to produce the following glare for receptors at this location:

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







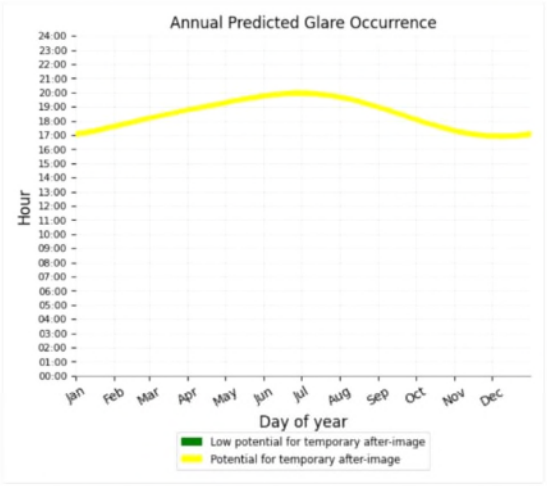


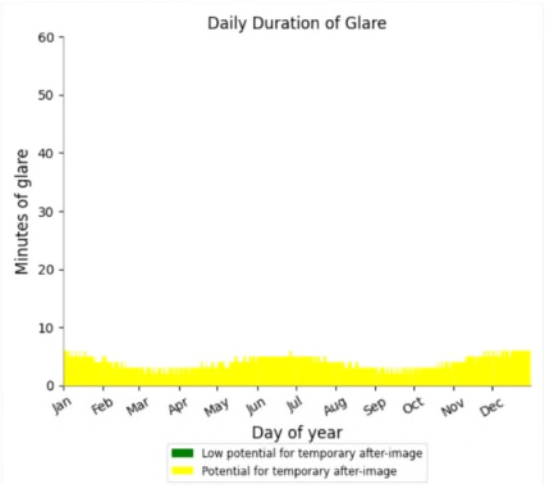
Glare Instance 13

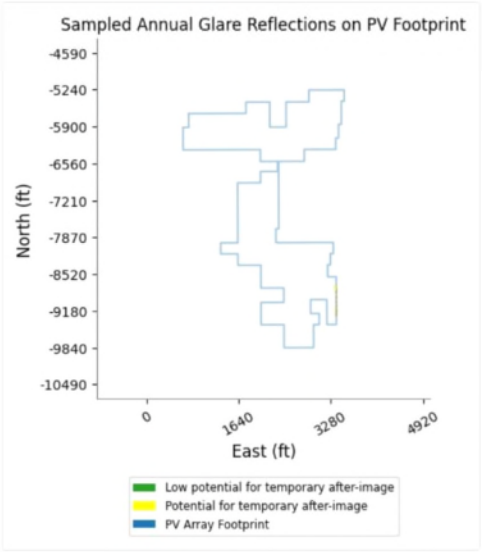
PV Array M - OP Receptor (OP 160)

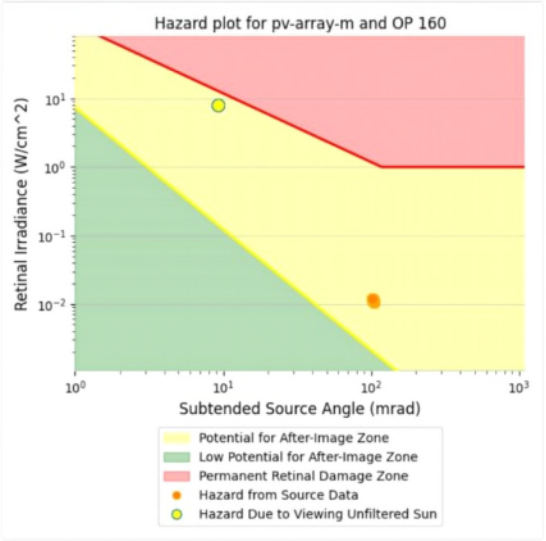
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,461 minutes of "yellow" glare with potential to cause temporary after-image.







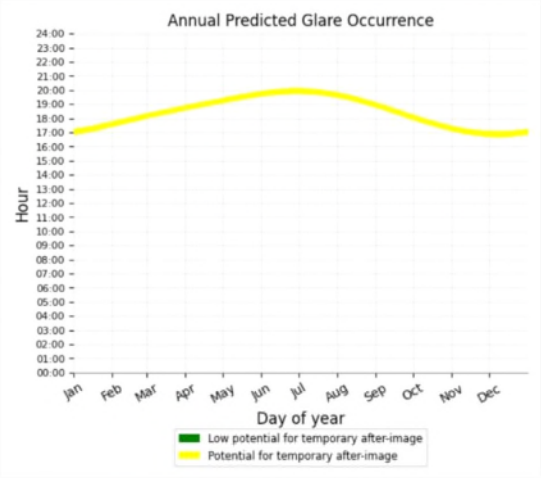


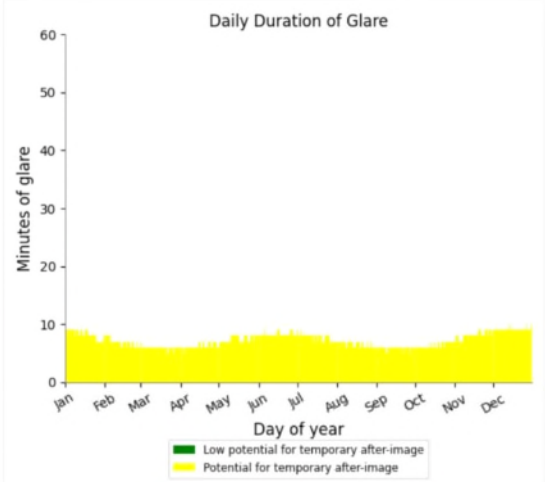
Glare Instance 14

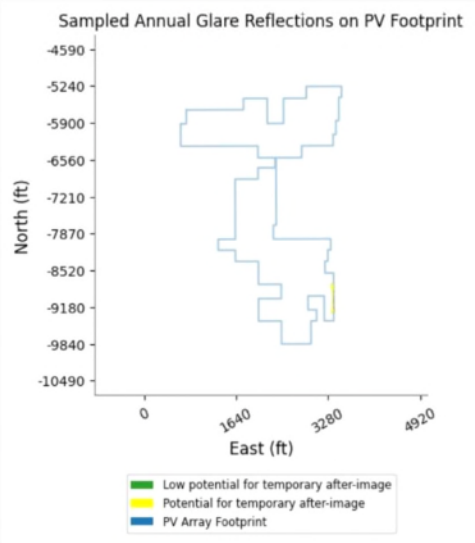
PV Array M - OP Receptor (OP 162)

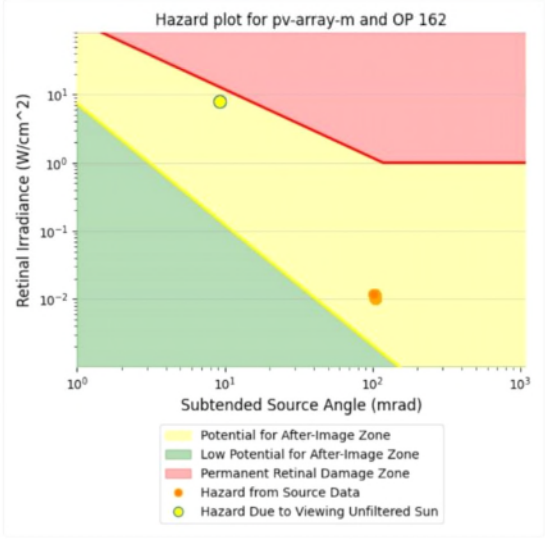
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 2,638 minutes of "yellow" glare with potential to cause temporary after-image.







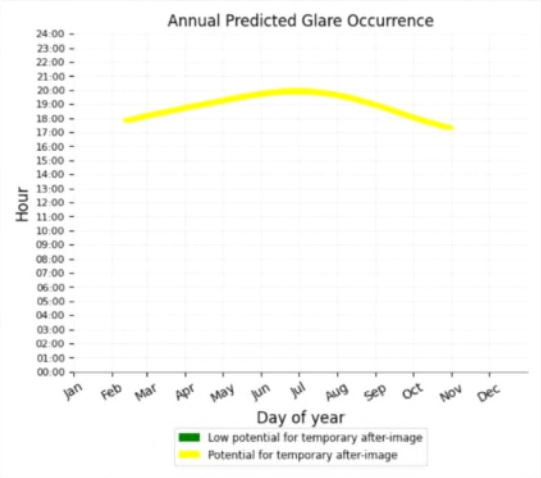


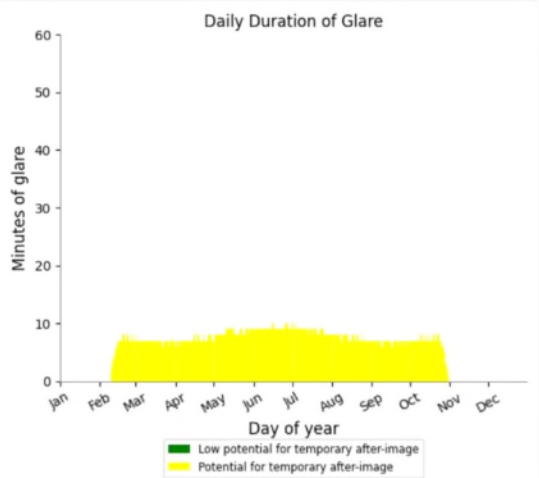
Glare Instance 15

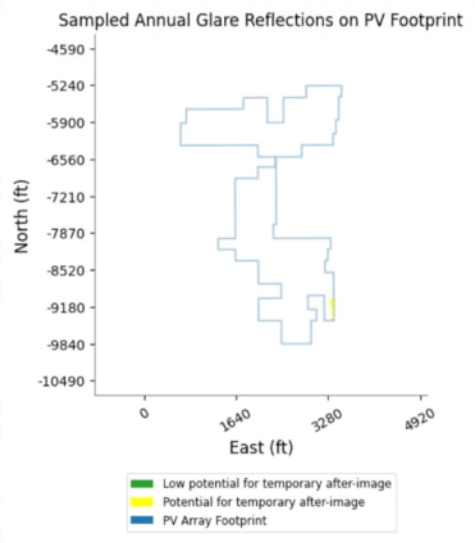
PV Array M - OP Receptor (OP 166)

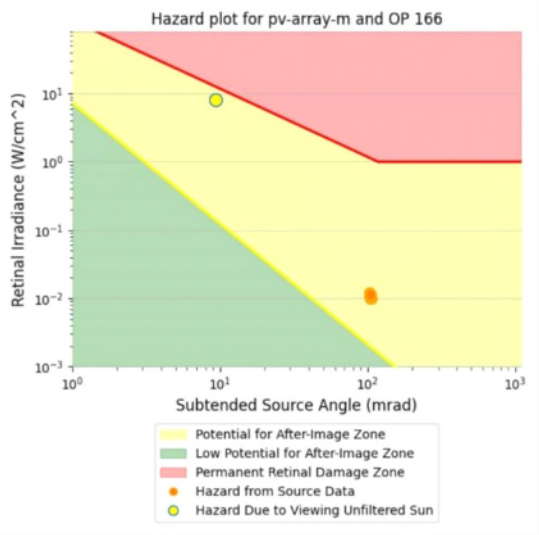
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,999 minutes of "yellow" glare with potential to cause temporary after-image.







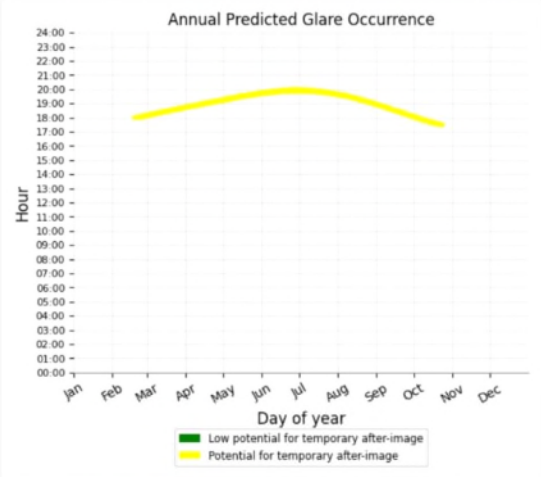


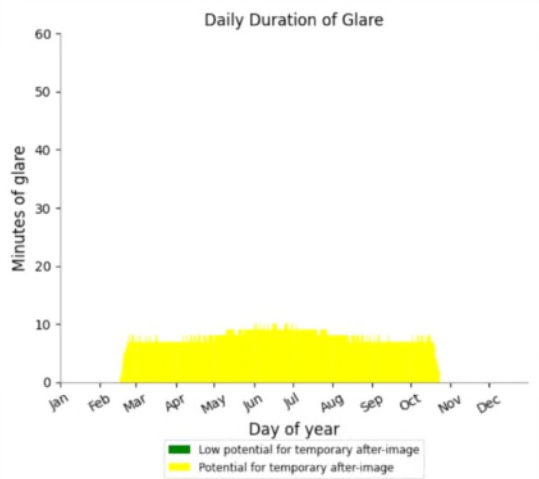
Glare Instance 16

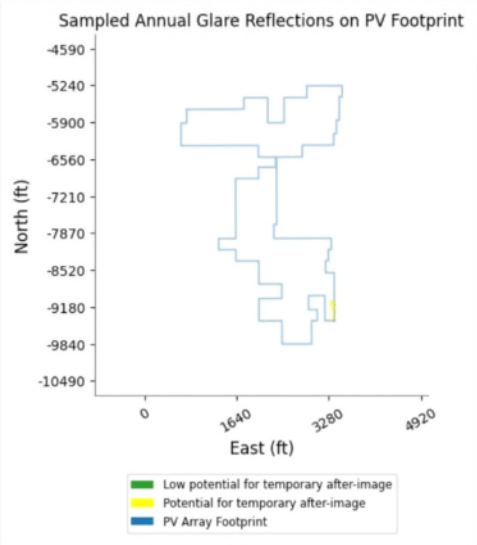
PV Array M - OP Receptor (OP 168)

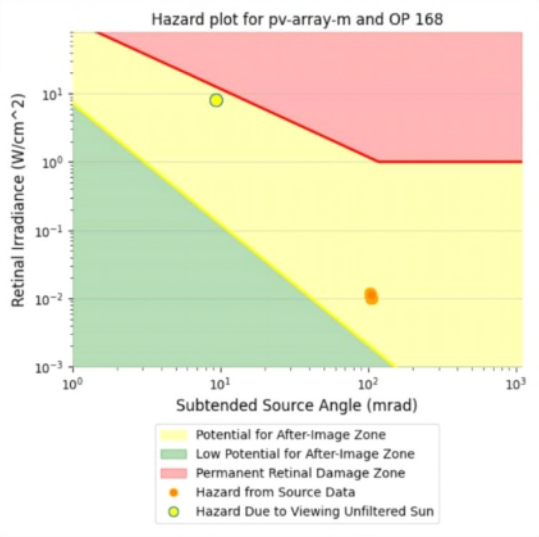
PV array is expected to produce the following glare for receptors at this location:

- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,939 minutes of "yellow" glare with potential to cause temporary after-image.







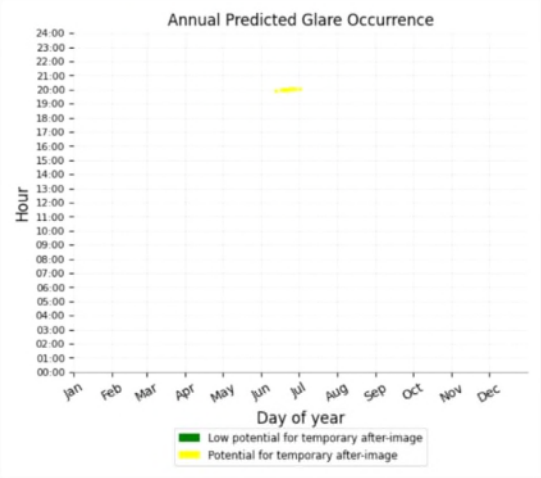


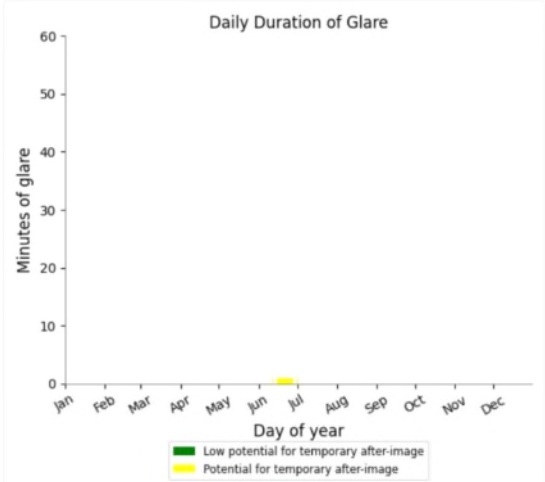
Glare Instance 17

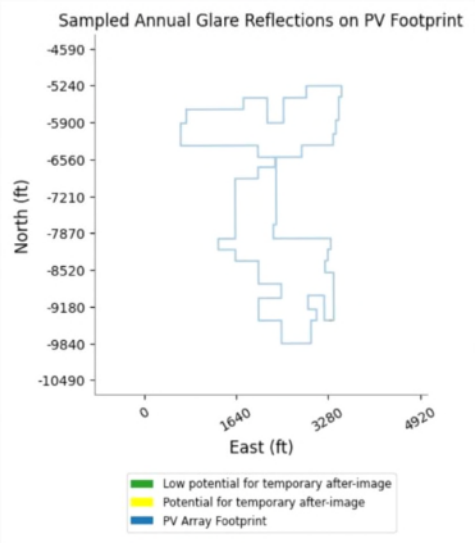
PV Array M - OP Receptor (OP 170)

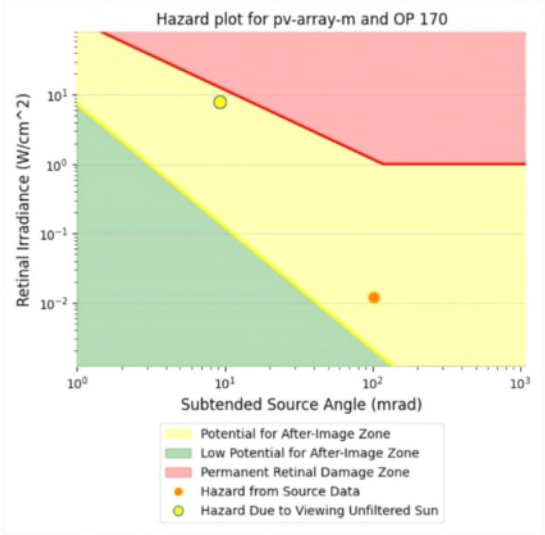
PV array is expected to produce the following glare for receptors at this location:

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







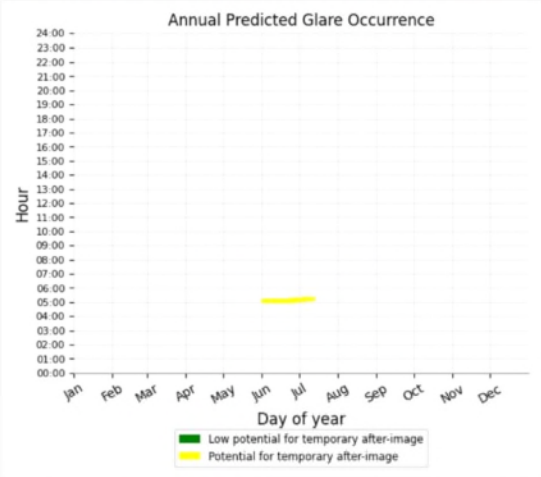


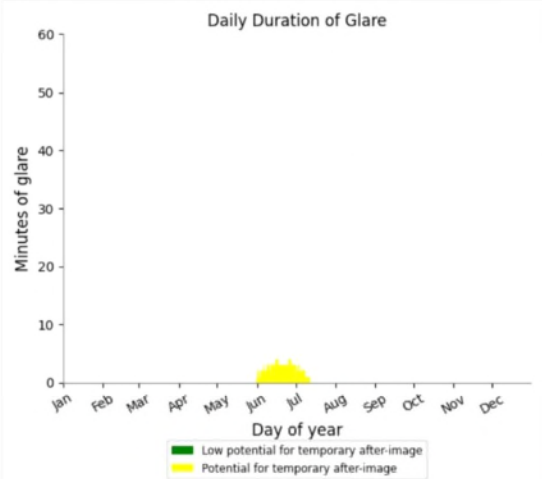
Glare Instance 18

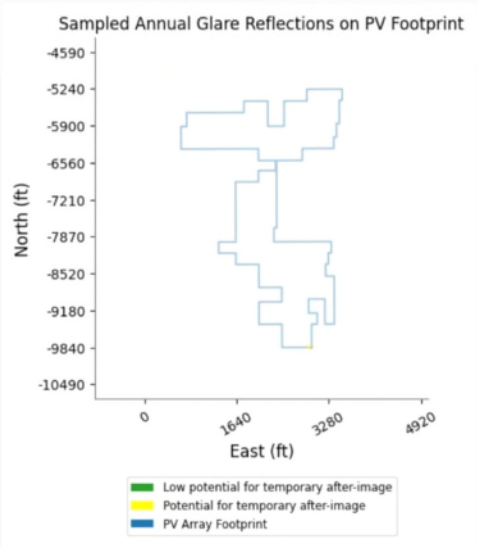
PV Array M - OP Receptor (OP 178)

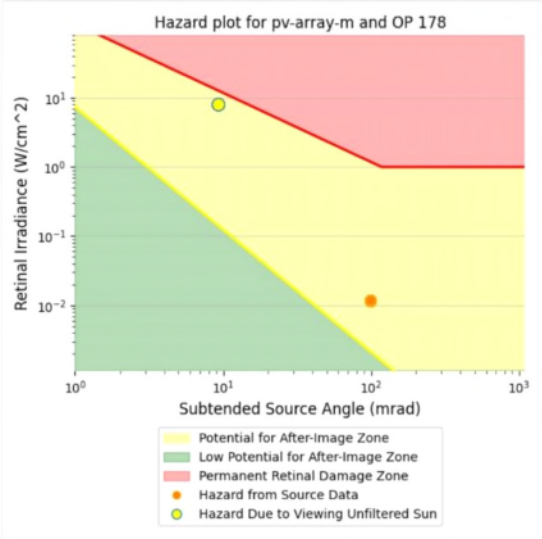
PV array is expected to produce the following glare for receptors at this location:

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







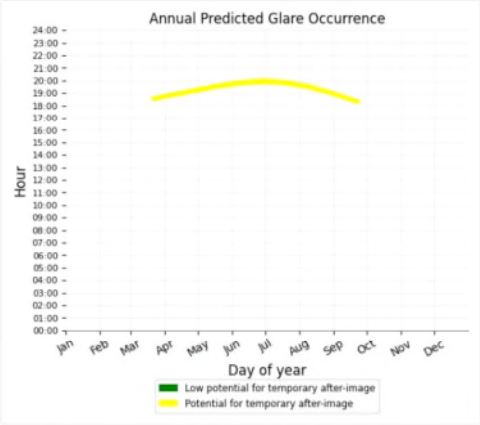


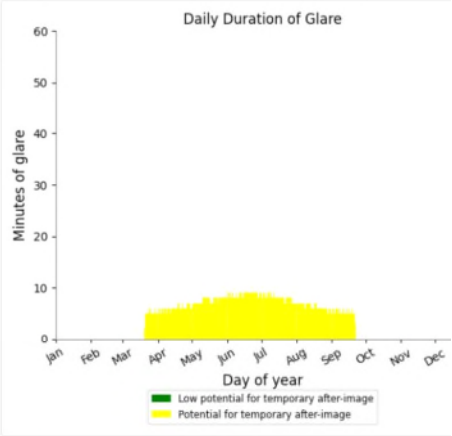
Glare Instance 19

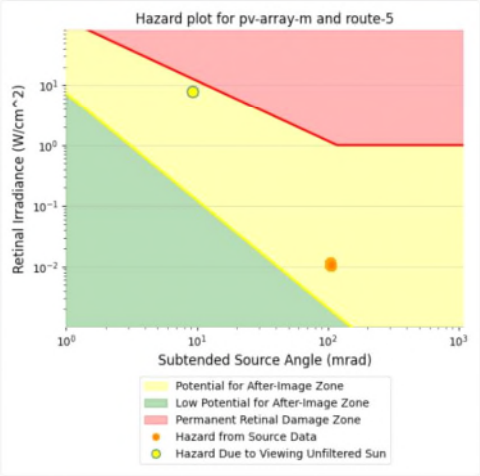
PV Array M - Route Receptor (Route 5)

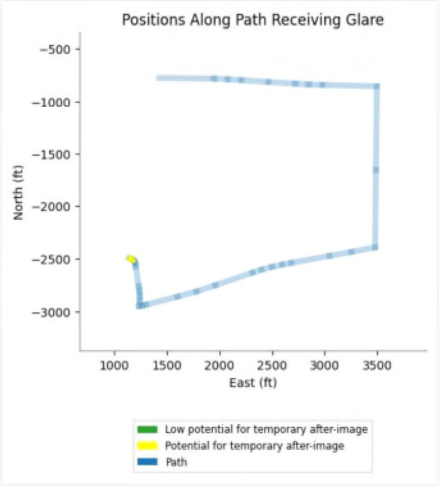
PV array is expected to produce the following glare for receptors at this location:

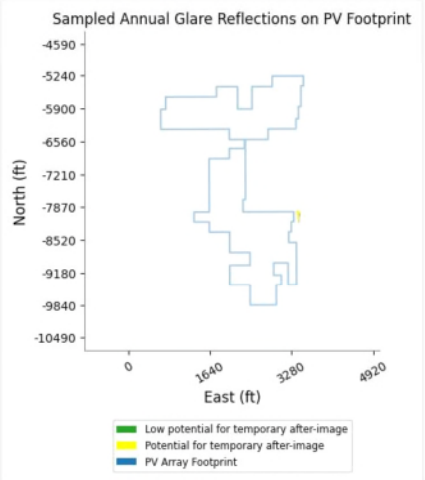
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,295 minutes of "yellow" glare with potential to cause temporary after-image.









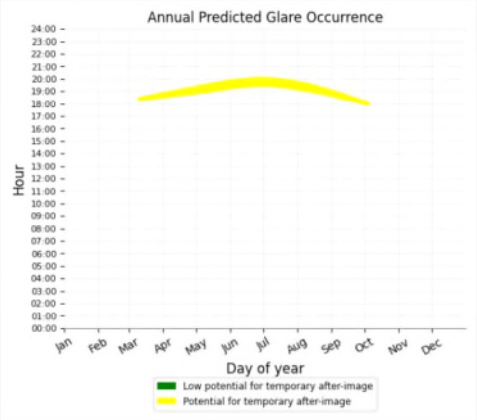


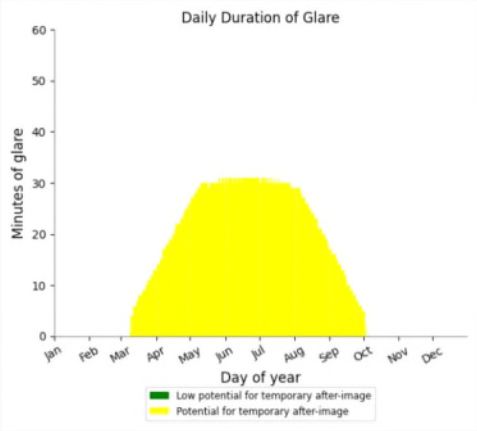
Glare Instance 20

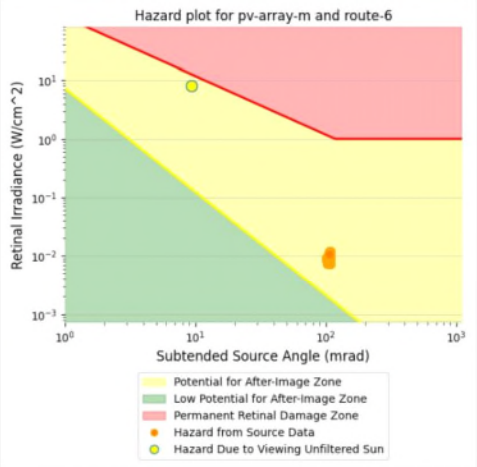
PV Array M - Route Receptor (Route 6)

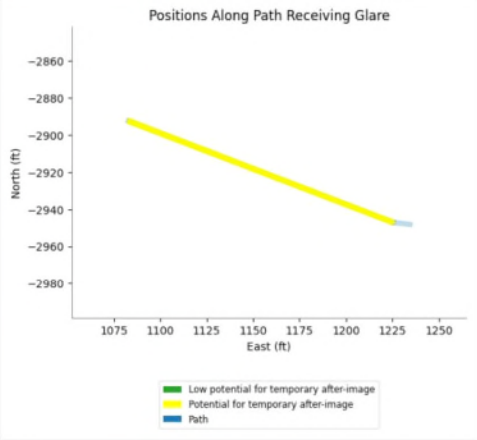
PV array is expected to produce the following glare for receptors at this location:

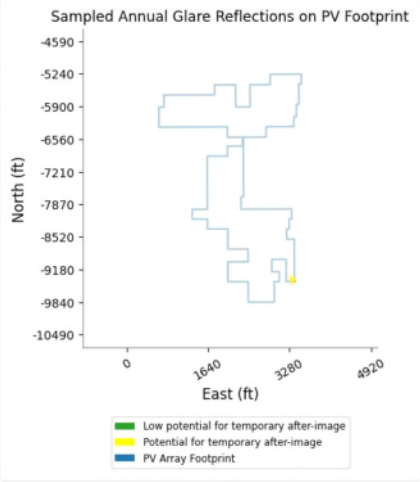
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 4,663 minutes of "yellow" glare with potential to cause temporary after-image.











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Summary: Notice Notice of Filing Responses to Staff Data Requests electronically filed by Ms. Anna Sanyal on behalf of Blossom Solar, LLC