

*Appendix A*  
*Applicant Responses to Selected PPRP Data Requests*

**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 1  
RESPONSE DATE: September 4, 2018**

**Item No.: PPRPDR1-8** Initial analysis of Maryland IMAP LiDAR data and the Solar Array Layout provided shows that approximately half of the footprint of the solar panel arrays are on areas with slopes greater than 5%, which will require level spreaders. Approximately 1.6 acres of solar panel arrays are on areas with slopes greater than 10%, which cannot support solar panels without grading. Please provide a grading plan that details how these slopes will be modified to support the proposed solar arrays. If a grading plan is not available, please provide a schedule for when this information will be provided to PPRP for review.

**RESPONSE:**

Under Maryland Code there is no prohibition for using slopes exceeding 10% for solar panel installation. It does require stormwater management practices include BMPs, which are in addition to the use of level spreaders onsite. This will be addressed as part of the SWM report and concept design to be reviewed with the Town and Carroll County.

**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 1  
RESPONSE DATE: September 4, 2018**

**Item No.: PPRPDR1-10** Will Citizens UB Solar LLC or Potomac Edison be responsible for vegetation management within the existing transmission line rights-of-way (ROWs) on the Project site?

- a) If Citizens UB Solar LLC will be the responsible party, please describe all communications between Citizens UB Solar LLC and Potomac Edison about vegetation management conditions that may apply to these ROWs under existing Potomac Edison CPCNs.
- b) If Citizens UB Solar LLC will be the responsible party, please provide a schedule for when a vegetation management plan for the ROWs will be provided to PPRP for review.

**RESPONSE:**

- a) There have been no discussions to date with Potomac Edison on this topic. Currently, the existing tenant on site maintains the ROW as this area is currently being farmed. Because of this existing relationship, Citizens UB Solar, LLC anticipates maintaining these areas.
- b) Citizens UB Solar LLC will maintain the ROWs at the same time as the vegetative maintenance beneath the solar arrays. Citizens UB Solar LLC anticipates that to be approximately 4 times per year.

**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 2  
RESPONSE DATE: November 5, 2018**

**Item No.: PPRPDR2-5** Page 25-26 of the Applicant's ERD states a staging area will be utilized for unloading of equipment and materials, but the location of the staging area was not identified.

- a) Please provide an update on where the construction staging area will be located.
- b) If a construction staging area still has not yet been identified, is it the Applicant's intention that the construction staging area will be entirely within the project's Limit of Disturbance (LOD)?

**RESPONSE:**

- a) The Applicant will be designating a construction staging area location during the site plan preparation with the Town of Union Bridge and Carroll County.
- b) Yes. The Applicant intends to designate a construction staging area within the Limit of Disturbance.



**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 2  
RESPONSE DATE: November 5, 2018**

**Item No.: PPRPDR2-8** Page 25 of the Applicant's ERD states major material and equipment will be delivered by tractor-trailers. In addition, excavation and other equipment will be delivered for use during construction, including trenching, grading, and unloading equipment. Daily construction traffic will include cars, pickup trucks and other personnel vehicles.

- a) Please estimate the number of truck trips that will be required to deliver excavation, grading, aggregates and other ground preparation vehicles to the Project.
- b) Please estimate the number of truck trips that will be required to deliver array components (solar panels, support structures, inverters, cables, etc.) to the Project.
- c) Please provide a preliminary construction phasing plan describing major on-site equipment, average truck deliveries per day, and duration in weeks.

**RESPONSE:**

- a) The Applicant anticipates approximately 7-10 truck trips associated with construction delivery equipment (Misc. Material Trucks - 42' Tractor Trailer).

- b) See estimated breakdowns below:

Major System Component Deliveries

Racking Trucks (42' Tractor Trailer) = 25-30

Combiner Box Trucks (42' Tractor Trailer) = 1-2

Module Trucks (42' Tractor Trailer) = 35-40

Inverter Trucks (42' Tractor Trailer) = 5

MV Switchgear Trucks (42' Tractor Trailer) = 1

Concrete Trucks = 5-7

Daily Construction Personnel Traffic

Foremen & Staff Vehicles (Pickup Trucks) = 5/day

Site Construction Staff (Cars, SUV, Pickup Truck) = 20-25/day (Applicant encourages and assumes employees will carpool and commute together.)

- c) A preliminary construction phasing plan is outlined below. As the Applicant continues to work through the local site plan and construction document preparation, these preliminary assumptions may change as we receive further input and comment from the Town/County.

In order to ensure minimal impact during the deliver and construction phase, the Applicant proposes the following preliminary plan:

- All truck deliveries will have a duration of two (2) hours onsite and be staggered so that no more than four (4) trucks are onsite at any given time.
- Deliveries will commence at 9:00 and stop at 2:00 to mitigate disruptions to the existing commuter traffic.
- Racking trucks, combiner box, and miscellaneous material trucks will arrive onsite in the first thirty to sixty (30-60) days.
- Module trucks will begin arriving around the 90 day mark and deliveries will continue for approximately 30 days. Four (4) module trucks will arrive every day for approximately two to three (2-3) weeks.
- Inverter trucks will arrive approximately two (2) weeks after the module trucks begin deliveries. One (1) inverter trucks will arrive every day.
- The MV switchgear delivery will arrive approximately two (2) weeks after the inverter trucks.
- Daily construction traffic will be kept to a minimum with entrance to the site Monday-Friday, starting at 6:30 to 5:00.

The peak construction crew of twenty (20) to twenty-five (25) vehicles per day will be during a two (2) month timeframe. Months before peak construction as well as after peak construction are expected to be manned with less than half of the peak estimated construction staff. Few, if any, oversized or overweight vehicles necessary for material delivery to this project.

**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 4  
RESPONSE DATE: December 26, 2018**

**Item No.: PPRPDR4-1** In response to PPRP Data Request No. 1-10, the Applicant indicated it would be responsible for vegetation management and maintenance of the areas inside the existing transmission line rights-of-way.

- a) Would the Applicant object to creating a specific long-term pollinator habitat zone in those areas, distinct from the vegetation under the panel arrays? If the Applicant would object, please explain the reason(s) for the objection.
- b) Would the Applicant object to developing, as part of the grounds management plan, a detailed vegetation management plan for those areas? (Detailed vegetation management plans typically include a list and description of all intended target native plant species, methods for planting, management methods for mowing, herbicides, and invasive species, and projected success goals for the pollinator habitat.) If the Applicant would object, please explain the reason(s) for the objection.
- c) Is the Applicant interested in obtaining a “pollinator friendly solar facility” certification for this project?

**RESPONSE:**

- a) Yes the applicant would object to this. The Applicant intends to maintain these areas for agricultural activities. Since some of the adjacent land to the ROWs is not being utilized for the project and will remain in agriculture, it is intended to keep the ROWs in agriculture as well. If for some reason these areas are not utilized for agriculture, the Applicant would consider creating a pollinator habitat zone in these areas.
- b) Given that we intend to keep the areas in agriculture, there is no need for a vegetation plan.
- c) If the Applicant stops agriculture activities on site, we would be interested in this certification.

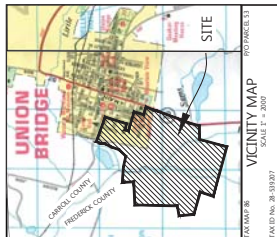
**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 5  
RESPONSE DATE: May 7, 2019**

**Item No.: PPRPDR5-1** The Applicant's Revised Environmental Review Document dated April 11, 2019 (Revised ERD) provided a reduced-resolution image of the site plan, shown as Figure 5 – Union Bridge Design Concept and Solar Array Layout, which was not legible enough to see important details about the project, including landscaping. Please provide a high-resolution (full-scale) electronic copy of this plan that provides, at a minimum, clearly labeled transformer pad locations and describes the landscaping proposed for the project.

**RESPONSE:**

*Attachment A* includes the high-resolution file which identifies the information requested. Please note, this exhibit has been modified since the revised ERD was submitted. The revised design only includes two (2) inverters instead of three (3)/four (4).

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**CASE NO. 9483**

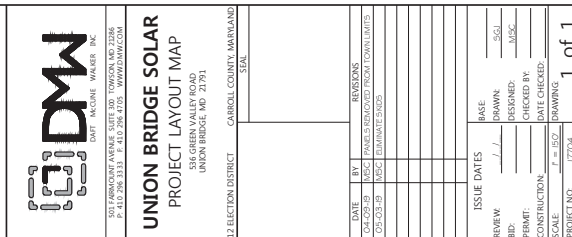
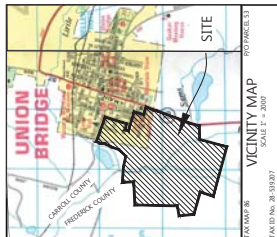
**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 5  
RESPONSE DATE: May 7, 2019**

**Item No.: PPRPDR5-2** Page 19 of Applicant's Revised ERD states there will be "three (3) separate transformer pads each with one (1) transformer per pad." Page 9, Figure 6 states there will be 33 transformers integrated on skids with inverters. Page 8, Figure 5 appears to show four transformer pads within the project boundary.

- a) Please confirm the number of transformers for the project.
- b) If necessary, please provide an updated Figure 5.

**RESPONSE:**

- a) The number of transformers proposed for the project is 2. All sections should read, "there will be two (2) separate equipment pads, each with one (1) transformer per pad."
- b) *Attachment A* is an updated Figure 5 with the appropriate locations of the two (2) equipment pads.



**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 5  
RESPONSE DATE: May 7, 2019**

**Item No.: PPRPDR5-4** Pages 3, 19, and 34 of the Applicant's Revised ERD mention that there will be an emergency entrance for the project located off of E. Whyte Street. This entrance does not appear to be shown in Figure 5 of the Applicant's Revised ERD. Please provide an updated Figure 5 that includes all project entrances.

**RESPONSE:**

The emergency entrances mentioned on Pages 3, 19, and 34 of the ERD is incorrect. The entrance on E. Whyte Street is no longer proposed with the latest redesign. As shown on Figure 5 the project will utilize the existing Kilfadda Farm entrance along the west side of S. Main Street as well as a new entrance on the east side of S. Main Street. An emergency access gate is also proposed along the west side of S. Main Street.



**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 5  
RESPONSE DATE: May 7, 2019**

**Item No.: PPRPDR5-7** Page 27, Table 2 of the Applicant's Revised ERD lists an on-site substation as part of the project's impervious area calculations. The Applicant's previous response to PPRP Data Request No. 2-1 had stated that "due to the interconnection voltage being the same as our collection voltage, there is no need for a project substation."

- a) Please clarify if a project substation will be required for the revised project as described in the Applicant's Revised ERD.
- b) If a substation will be required, please provide an updated Figure 5 with the location of the project substation clearly labeled.
- c) If a substation is not required, please provide a corrected version of Table 2 summarizing the project's impervious area.

**RESPONSE:**

- a) The information provided in Data Request 2 is correct. No onsite substation will be required since the voltage produced by the project is compatible with the existing power lines.
- b) Figure 5 is correct. As noted in a) above, no onsite substation is required.
- c) Table 2 has been corrected as shown below to remove impervious area associated with an onsite substation.

**Table 2 – Impervious Area Tabulation**

Impervious Area Description	Length (FT)	Width (FT)	Area (SF)	Quantity	Total Area (SF)	Comments
Xfmr/Equipment Pads (Concrete)	42	11	462	2	924	Skid Mounted Transformer
Racking Posts	-	-	0.03080	2,225	69	Array Piers & Motor Piers (W6x15 Max Size)
Array Field Access Ways – Grass Aisles	-	-	-	-	-	Grass Only, No Improvements
Proposed Entrance Improvements	-	-	-	2	2,400	Conceptual / Approximate
Total Impervious Area					3,393	SF
					0.08	Acres

**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 5  
RESPONSE DATE: May 7, 2019**

**Item No.: PPRPDR5-8** The Applicant's Revised ERD states that no water use or appropriation is required for the project, other than that required for construction dewatering purposes.

- a) Please state if any underground components of the solar facility will require the Applicant to perform dewatering of any excavations to facilitate construction activities if groundwater is encountered.
- b) If there are plans to perform dewatering, has the Applicant determined if an appropriations permit is required under COMAR 26.17.06.03 B (3)? If a permit is required, please provide the documentation necessary to obtain a Permit to Appropriate and Use Waters of the State as part of the CPCN application because the withdrawal of groundwater for dewatering requires a new appropriation issued by the Maryland PSC through this CPCN proceeding.
- c) If the documentation requested in Data Request No. 5-8 (b) has not yet been prepared, then please provide an estimate of when it will be provided.

**RESPONSE:**

- a) In general, due to the ground elevations and deeper water tables, most of the Project will not require dewatering for underground utilities. Where panels are located at lower elevations closer to the farm house, mapped wetlands, and floodplains will most likely require dewatering during construction.
- b) The Applicant intends to apply for an appropriation permit under COMAR 26.17.06.03 B (3) only if the quantity of dewatering exceeds an annual average amount of 10,000 gallons per day (gpd). However, until the design has been reviewed and approved as part of the local site plan process, it would be premature to guess on dewatering needs.
- c) The Applicant anticipates preparing the appropriation permit application (if needed) after the preliminary site plan has been approved by the County.

**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 5  
RESPONSE DATE: May 7, 2019**

**Item No.: PPRPDR5-11** Section 4.D.1 of the Applicant's Revised ERD indicates that no forests will be cleared, and Section 5.A of the Revised ERD indicates a 35' setback from the drip line of the wooded perimeter of the project. However, Figure 5 in the Revised ERD appears to show access roads encroaching into existing forest stands.

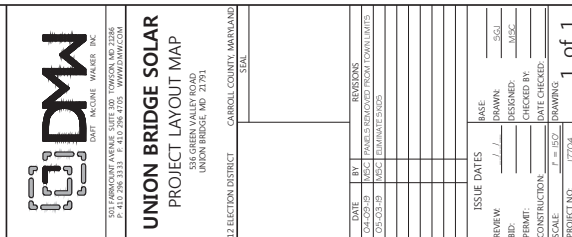
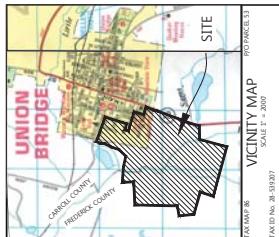
- a) Please define the acreage and approximate number of trees to be cleared, and provide a revised description of the setbacks along the wooded perimeter of the project.
- b) If the access roads will not encroach on the drip line of the wooded perimeter, please provide a high-resolution electronic copy of the revised site plan illustrating the locations of the access roads and fences.

**RESPONSE:**

- a) The Applicant is not proposing to cut trees for the project. It is the Applicants intent to provide thirty-five feet (35') from the dripline of the trees to the panels in all locations.
- b) As noted in **DR5-3**, Figure 5 reflects a thirty-five percent (35%) design level. The tree line locations are still being refined as they have not yet been surveyed. What is shown on Figure 5 is an approximate location. It is still the Applicants intent to provide thirty-five feet (35') from the dripline of the trees to the panels in all locations. Field located the dripline of the trees will be done during the local site plan process and civil design plans will be updated accordingly.

The access road shown in Figure 5 is based on an actual existing road/cut-through within the tree lines which crosses the previous railroad right-of-way.

*Attachment A* includes a high-resolution electronic copy of the plan.



**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 5  
RESPONSE DATE: May 7, 2019**

**Item No.: PPRPDR5-12** Section 4.D.1 of the Applicant's Revised ERD indicates that ECS is developing a revised Forest Stand Delineation and FCA Worksheet. Please provide a schedule for when these documents will be available for PPRP review.

**RESPONSE:**

*Attachment A* includes ECS's updated FSD and FCA Worksheet.

## FOREST CONSERVATION WORKSHEET

Forest Thresholds: Industrial/Institutional – 15% minimum forest cover  
All other zoning 20% minimum forest cover

A. Proposed Forest Area Removed: 0

### Reforestation Required:

Required Reforestation = All forest area removed is to be reforested at a ratio of one acre planted for every acre or portion thereof removed.

### AFFORESTATION CALCULATION

B.	Total Net Tract Area:	<u>52.3</u>
C.	Threshold Required: <u>15%</u> or 20%	<u>7.85</u>
D.	Existing Forested Area:	<u>2.8</u>
	MINUS FOREST CLEARED:	<u>0</u>
	PLUS REFORESTATION:	<u>0</u>
	(If applicable)	
	EQUALS FOREST CREDIT: =	<u>2.8</u>
E.	C minus D:	<u>5.05</u>

(If C minus D > 0, this is required of afforestation. If C minus D < 0, no afforestation is required).

## AGRICULTURAL DISTRICTS F.C. WORKSHEET

### REFORESTATION CALCULATION

A.	Total number of lots	<u>                    </u>
B.	For each lot, total proposed forest area removed.	<u>                    </u>
C.	For each lot, if more than 20,000sq. ft. Reforestation at 1:1.	<u>                    </u>
D.	For each lot, if more than 25,000sq. ft Reforestation at 2:1	<u>                    </u>

(Separate calculations must be performed for each lot. Use additional worksheets if necessary).

E. Total reforestation required for all lots                     

### AFFORESTATION CALCULATION

A.	Total Net Tract Area:	<u>                    </u>
B.	Threshold Required – 20%	<u>                    </u>
C.	Existing Forested Area	<u>                    </u>
	PLUS REFORESTATION=	<u>                    </u>
	(IF APPLICABLE)	
D.	B-C =Afforestation requirement:	<u>                    </u>

Figure  
3:3

[illegible]



[illegible]



**FOREST STAND DELINEATION REPORT  
UNION BRIDGE PROPERTY  
CARROLL COUNTY, MARYLAND**

**ECS PROJECT NO. 47:4146**

**FOR**

**CITIZEN ENTERPRISES CORPORATION**

**OCTOBER 2017  
REVISED MAY 2019**



October 13, 2017  
Revised May 1, 2019

Mr. Dane Bauer  
Citizen Enterprises Corporation (c/o H & B Solutions)  
37534 Oliver Drive  
Shelbyville, Delaware 19975

ECS Project No. 47:4146

Reference: Forest Stand Delineation Report  
Union Bridge Property  
536 Green Valley Road  
Union Bridge, Maryland

ECS Mid-Atlantic, LLC (ECS) is pleased to present this Forest Stand Delineation Report for the above-referenced project in general accordance with ECS Proposal No. 47:4170-EP, dated April 13, 2017. Carroll County requires forest stand delineation plans be submitted to the County as part of the proposed development of the site. County requirements for the forest stand delineation submittal are presented in the Methods section.

### **PROPERTY DESCRIPTION**

The Union Bridge Property is located along S Main Street in Union Bridge, Maryland. The project consists of approximately 60.9 acres, with the majority of the project and the wooded areas located west of S Main Street and south of W Locust Street, with approximately 4 acres located east of S Main Street containing no forested areas. The site consists of undeveloped land with a mix of agricultural and wooded areas. The surrounding parcels are a mix of industrial, residential, agricultural properties or undeveloped and wooded land.

The wooded areas on the western side of Main Street are disconnected from primary forested areas, part of the patchwork nature of the rural agricultural landscape of the surrounding area. The disturbance of the land over the years, including farming practices and associated clearing, has left the property less than ideal to support habitat for wildlife. There were no wooded areas observed on the parcel on the eastern side of Main Street.

### **SECONDARY INFORMATION**

Secondary Information entails the background research and review of recorded data and mapping pertaining to the project site. Resources include but are not limited to:

- U.S. Geological Survey (USGS) Topographic Map, Union Bridge, MD Quadrangle, 2017
- Carroll County Website and Mapping;
- Natural Resources Conservation Service (NRCS) online soils database;  
<http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=MD>

- Available aerial photography and GIS information; NETR Online <http://www.historicaerials.com/>, Google Earth

The USGS Union Bridge Quadrangle map shows elevations of approximately 400 to 420 feet above mean sea level (MSL) throughout the site. The soil survey indicates that the site is underlain primarily by the soil units listed in Table 1 below.

**Table 1 – Soil Units Onsite**

Soil Unit	Hydric Rating
BcB: Benevola silt loam, 3 to 8 percent slopes	0
CoB: Conestoga silt loam, 3 to 8 percent slopes	0
LfA: Lindside silt loam, 0 to 3 percent slopes	5
LnC: Linganore channery silt loam, 8 to 15 percent slopes	0
LnD: Linganore channery silt loam, 15 to 25 percent slopes	0
WtA: Wiltshire silt loam, 0 to 3 percent slopes	0

## **METHODS**

Carroll County requires a forest stand delineation to be prepared by a qualified professional for all new developments 40,000 square feet or greater in size per COMAR Article 17 of the State Code and according to the County FSD Plan Checklist. A Forest Stand Delineation Plan shall include:

- Data collection: forest type, dominant size class, dominant trees, dominant canopy trees, number of trees per acre, number of dead trees per acre, common understory species, forest structure value, percentage of canopy coverage, understory coverage, herbaceous coverage, downed woody material, and invasive species;
- Specimen trees, defined as greater than 30 inches diameter at breast height (DBH), will be located, identified, measured, and their condition assessed;
- Locations of specimen tree critical root zones, forest interior dwelling species, forest stand boundaries, and stand acreages will be recorded; and
- A FSD report shall include:
  - A forest stand summary table comprised of the data collected in the field and mentioned above;
  - Stand summary sheets;
  - A narrative that describes forest stand conditions, methodology, and forest structure;

- A site location map; and,
- A site plan that delineates:
  - Natural features such as intermittent and perennial streams and their buffers; steep slope areas and erodible soils; and 100-year floodplain and drainage-way buffers;
  - Topography of existing conditions;
  - Hydric soils;
  - Habitats of rare, threatened and endangered species;
  - Trees designated as a national, state, or local champion;
  - Historic and archeological sites;
  - Trees with a DBH of 30 inches or greater;
  - Limits of forest areas, non-forested areas, and Forest Stand locations

## **FINDINGS**

ECS identified one (1) forest stand located within the project site containing woody vegetation. A forest stand delineation plan is attached showing the general location of the stand. A stand summary sheet and data sheets for individual plots can also be found attached. Four specimen trees were identified onsite and six others were observed to be located just offsite, primarily along the northwestern property boundary. None of the Specimen Trees are proposed for removal.

### **Stand A**

Stand A is approximately 417,591 square feet (9.5-acres) in size and is located across the central, western, and southern portions of the project area. It consists primarily of medium to large sized Maple and Oak trees, with an understory of sapling Maple, Hackberry, Hawthorn, and Tree of Heaven. Dominant and subdominant species are listed in Table 2 below. Stand density is uneven in age and size throughout the forest stand. Stand A has a moderate to high amount of understory growth, moderate to high amount of invasive species (including Norway Maple, Tree of Heaven, and Japanese Honeysuckle), and an average basal area of 150 SF per acre (BAF 10). Four specimen trees are located in Stand A onsite.

**Table 2 – Dominant Woody Vegetation: Stand A**

<b>Common Name</b>	<b>Scientific Name</b>
<b>Dominant Species</b>	
Silver Maple	<i>Acer rubrum</i>
Norway Maple	<i>Acer platanoides</i>
Box Elder	<i>Acer negundo</i>
<b>Subdominant Species</b>	
Northern Red Oak	<i>Quercus rubra</i>
White Oak	<i>Quercus alba</i>
American Sycamore	<i>Platanus occidentalis</i>
Common Hackberry	<i>Celtis occidentalis</i>

Tree of Heaven	<i>Ailanthus altissima</i>
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The overall health of the woodland is fair with some evidence of insect or fungal infestation throughout the Stand. Tree quality appears to be fair for wildlife habitat, providing some food sources and adequate canopy cover. According to the Carroll County soils map, Stand A is underlain primarily by soil units BcB - Benevola silt loam, LfA - Lindside silt loam, LnC/D - Linganore channery silt loam, and WtA - Wiltshire silt loam. The edges of this forest stand were disturbed by previous site activity (clearing for agricultural purposes) and had poorer tree quality and more vines and invasive plants relative to interior portions of the stand.

### **OVERALL SUMMARY**

Based on our site reconnaissance, the project site contains one (1) forest stand, dominated by Maple species. Four specimen trees were identified onsite and six others were observed to be located just offsite, primarily along the northwestern property boundary. The stand is in generally fair condition with sapling, pole, medium, and large trees in good or fair condition. Overall tree quality appears to be fair for wildlife habitat, providing some food sources and cover. A limited review of historical photographs and topographic maps indicate that the property has been in agricultural use since the 1950s, with only the areas near the property boundary remaining wooded. Based on this information, preservation of the wooded areas along the southwestern property boundary adjacent to Sam's Creek is recommended to assist in improving water quality. No other specific measures are recommended, as the stand does not appear to be of exceptional quality.

During construction, standard erosion and sediment control methods (tree protection fencing and/or super silt fencing) should be used to protect any tree conservation areas. Additionally, encroachment into the conservation areas should not take place within the drip-line of the conserved trees. Trees proposed to be taken within 10-feet of the conservation area or adjacent to the proposed alignment boundary should be removed or pruned by hand away from the preserved trees. Mulching the perimeter of conservation areas should be incorporated in order to reduce the effects of erosion and sedimentation.

ECS would like to thank Citizen Enterprises Corporation for the opportunity to provide you with this Forest Stand Delineation. We look forward to assisting you further with this project and other environmental concerns you may have. If you have any questions, please feel free to contact us at any time at 410-859-4300.

Sincerely,

**ECS MID-ATLANTIC, LLC**



Anna Allie MEM, ISA-CA  
Environmental Project Manager  
[AAllie@ecslimited.com](mailto:AAllie@ecslimited.com)

This Forest Stand Delineation has been prepared in accordance with all State and local ordinances which were in effect as of the date shown below. The undersigned is a qualified professional in accordance with COMAR 08.19.06.01.



James E. Irre

January 30, 2019

Date

## **FSD DATA SHEETS**

## Forest Sample Plot Field Data Sheet

Property: Union Bridge Prepared by: AEA/JAA  
 Stand #: A Plot#: 1 Plot Size: 30' Date: 6/12/17

Basal Area in  
sf/acre:  
**150**

Size Class of Trees within sample plot

Tree Species	# of Trees			#of Trees			# of Trees			# of Trees			# of Trees			Total
	2-5.9" dbh			6-9.9" dbh			10-17.9"dbh			18-29.9" dbh			> 30" dbh			
Crown Position	DOM	COD	OTH	DOM	COD	OTH	DOM	COD	OTH	DOM	COD	OTH	DOM	COD	OTH	
Norway Maple			5		5	1		5		1						17
Pignut Hickory			1				1									2
Hackberry			2					1		1						4
Tree of Heaven			1			1										2
American Elm						1										1
Box Elder			1		1											2
Northern Red Oak								2		1						3
Total Number of Trees per Size Class	10			9			9			3			0			31
Number of standing dead trees 6" dbh or greater	4			1			1									6

1/100 Ac. Samples:

List of Common Understory Species 3'-20'	% Canopy Coverage							% Invasive Cover						
	C	N	E	S	W	Total		C	N	E	S	W	Total	
Box Elder, Norway Maple	100	80	95	85	95	91		5	5	10	20	30	14	
List of Herbaceous Species 0'-3'	% Understory Cover 3'-20'							% Herbaceous/ Woody Cover 0'-3'						
	C	N	E	S	W	Total		C	N	E	S	W	Total	
	2	2	2	10	10	5		2	50	30	2	2	17	
List of Invasive Species								Plot Successional Stage:						
Garlic Mustard, Norway Maple, Tree of Heaven, Bush Honeysuckle, Wineberry, Japanese Honeysuckle								Mid-successional Upland Silver Maple-American Elm Assoc.						

Comments:

Total number of tree species > 6": 7

sheet 1 of 2



## Forest Sample Plot Field Data Sheet

Property: Union Bridge Prepared by: AEA/JAA  
 Stand #: A Plot#: 2 Plot Size: 30' Date: 6/12/17

Basal Area in  
sf/acre:  
**150**

Size Class of Trees within sample plot

Tree Species	# of Trees			#of Trees			# of Trees			# of Trees			# of Trees			Total
	2-5.9" dbh			6-9.9" dbh			10-17.9"dbh			18-29.9" dbh			> 30" dbh			
Crown Position	DOM	COD	OTH	DOM	COD	OTH	DOM	COD	OTH	DOM	COD	OTH	DOM	COD	OTH	
Silver Maple			1			5	2	4		1						13
Box Elder			2		1	1				1						5
Hawthorn			1													1
Total Number of Trees per Size Class	4			7			6			1			0			19
Number of standing dead trees 6" dbh or greater				3												3

1/100 Ac. Samples:

List of Common Understory Species 3'-20'	% Canopy Coverage							% Invasive Cover						
Box Elder	C	N	E	S	W	Total		C	N	E	S	W	Total	
	95	80	75	60	95	81		2	2	5	5	5	4	
List of Herbaceous Species 0'-3'	% Understory Cover 3'-20'							% Herbaceous/ Woody Cover 0'-3'						
False Nettle, Poison Ivy, Hog Peanut, Wild Garlic, Queen Anne's Lace	C	N	E	S	W	Total		C	N	E	S	W	Total	
	40	10	20	40	50	32		50	80	60	70	50	62	
List of Invasive Species								Plot Successional Stage:						
Garlic Mustard, Japanese Honeysuckle								Mid-successional Upland Silver Maple-American Elm Assoc.						

Comments:

Total number of tree species > 6": 2

sheet 2 of 2

## PHOTOGRAPHIC LOG



**Photograph 1:** View of upland fields in the central portion of the site.



**Photograph 2:** View of Forest Stand A near FSA-1.





**Photograph 3:** View of ST-1 in Stand A.



**Photograph 4:** View of ST-2 in Stand A.





**Photograph 5:** View of ST-7 in Stand A.



**Photograph 6:** View of ST-9 in Stand A.



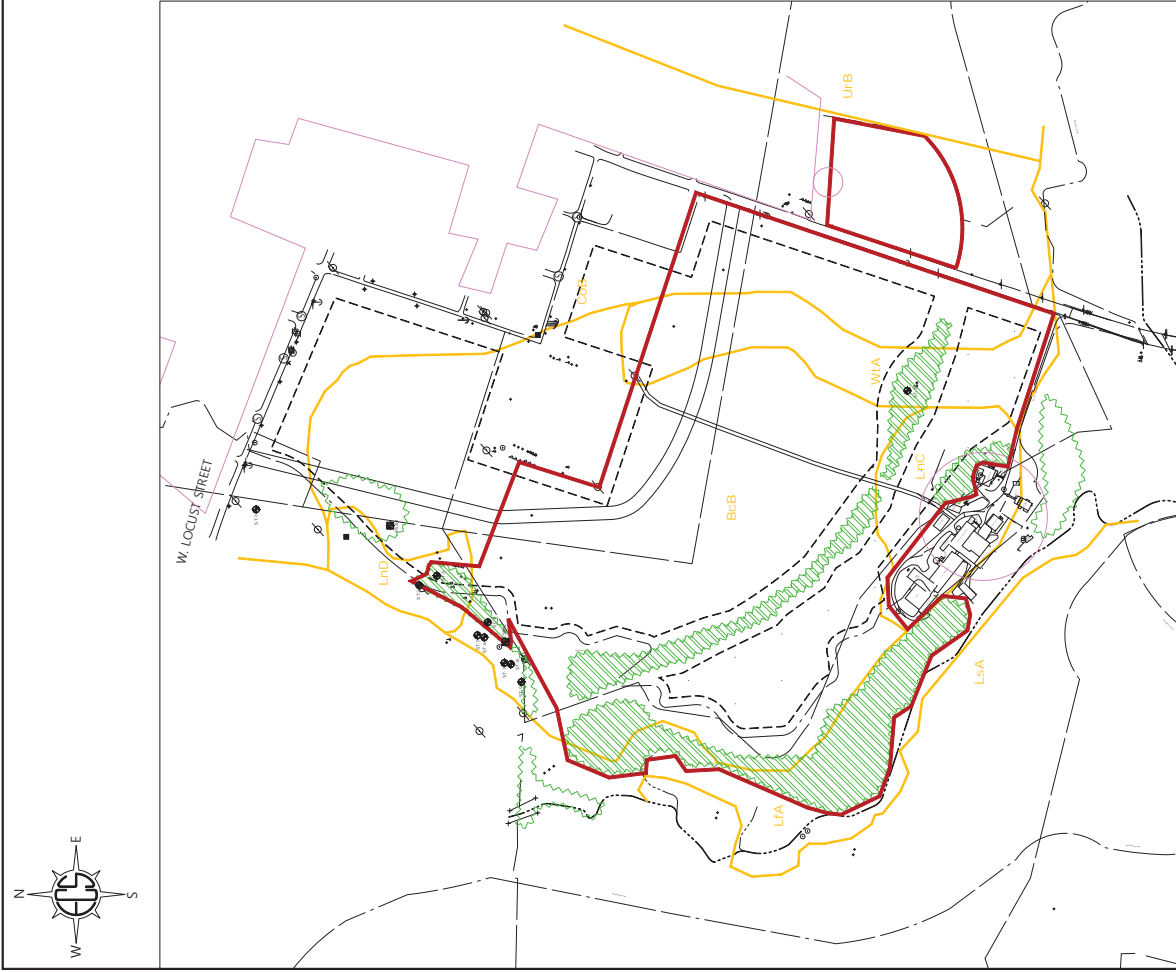
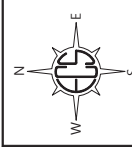


**Photograph 7:** View of Stand A near FSA-2.

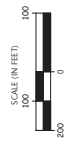


**Photograph 8:** View of the Stand A treeline in the central portion of the site.

## **FOREST STAND DELINEATION MAP**



This project was prepared by the firm listed below and is not to be used for any other purpose without the written consent of the firm listed below. The firm listed below is not responsible for any errors or omissions in this document. The firm listed below is not responsible for any errors or omissions in this document. The firm listed below is not responsible for any errors or omissions in this document.



- NOTES**
- ADJACENT LAND USES ARE PRIMARILY AGRICULTURAL AND RESIDENTIAL TO THE NORTH, INDUSTRIAL TO THE EAST, AGRICULTURAL TO THE SOUTH, AND RESIDENTIAL TO THE WEST.
  - GENERAL TO THE EAST, AND CONSERVATION TO THE SOUTH AND WEST.
  - ADJACENT LAND USES ARE PRIMARILY AGRICULTURAL AND RESIDENTIAL TO THE NORTH, INDUSTRIAL TO THE EAST, AGRICULTURAL TO THE SOUTH, AND RESIDENTIAL TO THE WEST.
  - STEEP SLOPES ARE NOT PRESENT ON SITE.
  - BASMAP SOURCE: DAVIS BOWEN & FREEL, INC.
  - THE SITE IS LOCATED WITHIN THE DOUBLE PINE CREEK WATERSHED (HUC 0243034).
  - THE SITE IS LOCATED WITHIN THE DOUBLE PINE CREEK WATERSHED (HUC 0243034).
  - PLEASE SEE FOREST STAND DELINEATION NARRATIVE FOR ADDITIONAL INFORMATION.
  - FIELD WORK WAS COMPLETED IN JUNE 2017.

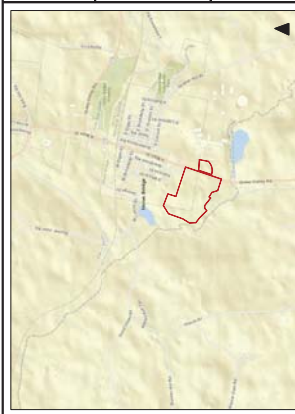
Soil Type Symbol	Map Unit Name	Hydrologic Rating (%)	Drainage Class	K-Value
BcB	BcB: Bennington silt loam, 3 to 5 percent	0	Well Drained	0.37
CsB	CsB: Cornsboro silt loam, 3 to 5 percent	0	Well Drained	0.32
LsA	LsA: Landon silt loam, 0 to 2 percent	5	Nonexposed (Well Drained)	0.37
LsC	LsC: Landon silt loam, 0 to 2 percent	0	Well Drained	0.37
LsD	LsD: Landon silt loam, 0 to 2 percent	0	Well Drained	0.37

**SPECIMEN TREE SUMMARY**

Tree Number	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-1	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-2	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-3	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-4	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-5	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-6	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-7	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-8	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-9	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments
ST-10	Common Name	Scientific Name	DBH (inches)	Condition	Condition Comments

- LEGEND**
- FOREST STAND A (S-5A)
  - APPROXIMATE TREELINE
  - FOREST STAND DATA POINT
  - SPECIMEN TREE LOCATION
  - STUDY AREA
  - APPROXIMATE SOIL UNITS
  - 100-YEAR FLOODPLAIN
  - APPROXIMATE MARYLAND INVENTORY OF HISTORIC PROPERTIES LISTING

VICINITY MAP (SOURCE: MERLIN)





**CASE NO. 9483**

**CITIZENS UB SOLAR LLC  
RESPONSE TO PPRP DATA REQUEST NO. 6  
RESPONSE DATE: June 7, 2019**

**Item No.: PPRPDR6-2** The Applicant's Revised Environmental Review Document dated April 11, 2019 (Revised ERD) describes a 48.30-acre project area on page 1. Please provide a GIS data layer showing this project boundary.

**RESPONSE:**

Please note, Daft-McCune-Walker, Inc. (DMW) reviewed the CADD files for the Project including the boundary survey DMW prepared, zoning maps from County GIS data, and flood plain maps from County GIS data. Based on these reviews, DMW has determined the following updated acreages/breakdowns:

**Zoning Project Areas:**

Conservation area = 16.40 acres

Restricted Industrial = 44.44 acres

General Industrial area = 3.85 acres

Total = 64.69 acres

**Project LOC Areas:**

Area within the fencing (west) = 29.62 acres

Area within the fencing (east) = 2.96 acres

Buffer areas (east and west) = 1.45 acres

Total = 34.03 acres

***Attachment A*** includes the CADD file for the revised Project. DMW does not operate in GIS.

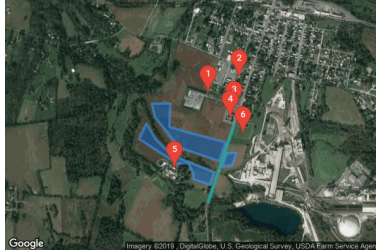
*Appendix B*  
*Glare Analysis*



## GlareGauge Glare Analysis Results

### Site Configuration: Fixed tilt bottom edge-temp-0

Project site configuration details and results.



Created **May 10, 2019 3:48 p.m.**  
 Updated **May 10, 2019 4:22 p.m.**  
 DNI **varies** and peaks at **1,000.0 W/m<sup>2</sup>**  
 Analyze every **1 minute(s)**  
**0.5** ocular transmission coefficient  
**0.002 m** pupil diameter  
**0.017 m** eye focal length  
**9.3 mrad** sun subtended angle  
 Timezone **UTC-5**  
 Site Configuration ID: 27851.3853

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

PV name	Tilt	Orientation	"Green" Glare	"Yellow" Glare	Energy Produced
	deg	deg	min	min	kWh
PV array 2	20.0	180.0	0	12,126	-
PV array 3	20.0	180.0	3	11,595	-
PV array 4	20.0	180.0	309	12,887	-

### Component Data

#### PV Array(s)

**Name:** PV array 2  
**Axis tracking:** Fixed (no rotation)  
**Tilt:** 20.0 deg  
**Orientation:** 180.0 deg  
**Rated power:** -  
**Panel material:** Smooth glass without AR coating  
**Vary reflectivity with sun position?** Yes  
**Correlate slope error with surface type?** Yes  
**Slope error:** 6.55 mrad



Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	39.565398	-77.184004	408.43	2.00	410.43
2	39.565381	-77.185248	392.93	2.00	394.93
3	39.564670	-77.185034	396.61	2.00	398.61
4	39.563082	-77.183382	422.87	2.00	424.87
5	39.562371	-77.180699	408.97	2.00	410.97
6	39.563355	-77.180243	421.95	2.00	423.95
7	39.563843	-77.182673	431.85	2.00	433.85
8	39.564157	-77.184047	415.69	2.00	417.69

**Name:** PV array 3**Axis tracking:** Fixed (no rotation)**Tilt:** 20.0 deg**Orientation:** 180.0 deg**Rated power:** -**Panel material:** Smooth glass without AR coating**Vary reflectivity with sun position?** Yes**Correlate slope error with surface type?** Yes**Slope error:** 6.55 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	39.564339	-77.185613	396.59	2.00	398.59
2	39.563529	-77.186107	396.07	2.00	398.07
3	39.562238	-77.183553	414.21	2.00	416.21
4	39.562255	-77.182781	415.44	2.00	417.44
5	39.561742	-77.182437	401.80	2.00	403.80
6	39.561411	-77.182394	395.79	2.00	397.79
7	39.561130	-77.181322	396.70	2.00	398.70
8	39.561775	-77.181021	407.37	2.00	409.37
9	39.562669	-77.183897	411.14	2.00	413.14
10	39.563512	-77.184991	400.64	2.00	402.64

**Name:** PV array 4**Axis tracking:** Fixed (no rotation)**Tilt:** 20.0 deg**Orientation:** 180.0 deg**Rated power:** -**Panel material:** Smooth glass without AR coating**Vary reflectivity with sun position?** Yes**Correlate slope error with surface type?** Yes**Slope error:** 6.55 mrad

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	39.562768	-77.180163	419.78	2.00	421.78
2	39.562073	-77.180485	406.02	2.00	408.02
3	39.562172	-77.179798	409.85	2.00	411.85
4	39.562801	-77.179519	419.00	2.00	421.00

## Route Receptor(s)

**Name:** Green Valley Road**Route type:** Two-way**View angle:** 50.0 deg

Vertex	Latitude	Longitude	Ground elevation	Height above ground	Total elevation
	deg	deg	ft	ft	ft
1	39.564212	-77.179697	436.33	6.00	442.33
2	39.560242	-77.181414	390.97	6.00	396.97

Discrete Observation Receptors

Number	Latitude	Longitude	Ground elevation	Height above ground	Total Elevation
	deg	deg	ft	ft	ft
OP 1	39.565958	-77.181416	430.59	6.00	436.59
OP 2	39.566810	-77.179313	431.66	6.00	437.66
OP 3	39.565146	-77.179674	436.55	6.00	442.55
OP 4	39.564633	-77.179910	437.00	6.00	443.00
OP 5	39.562004	-77.183684	417.74	6.00	423.74
OP 6	39.563804	-77.179081	437.99	6.00	443.99

## PV Array Results

### PV array 2 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	138
OP: OP 4	0	391
OP: OP 5	0	824
OP: OP 6	0	1514
Route: Green Valley Road	0	9259

### PV array 2 - OP Receptor (OP 1)

No glare found

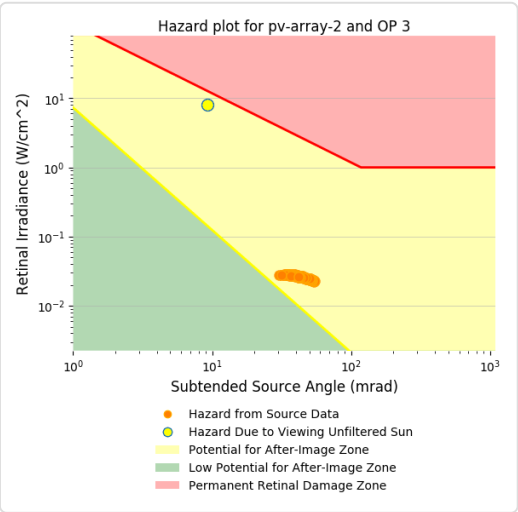
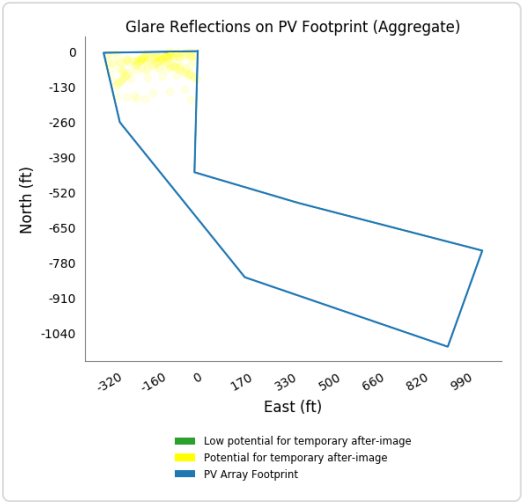
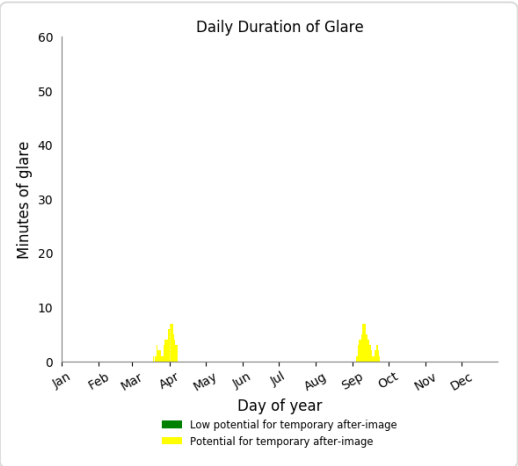
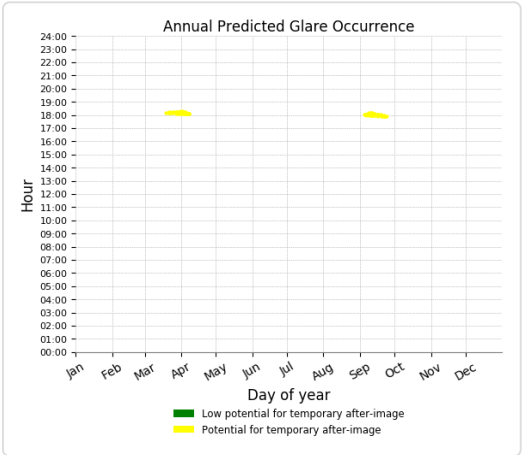
### PV array 2 - OP Receptor (OP 2)

No glare found

PV array 2 - OP Receptor (OP 3)

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

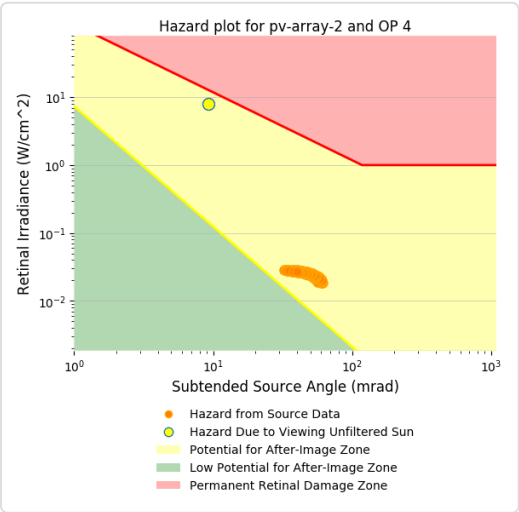
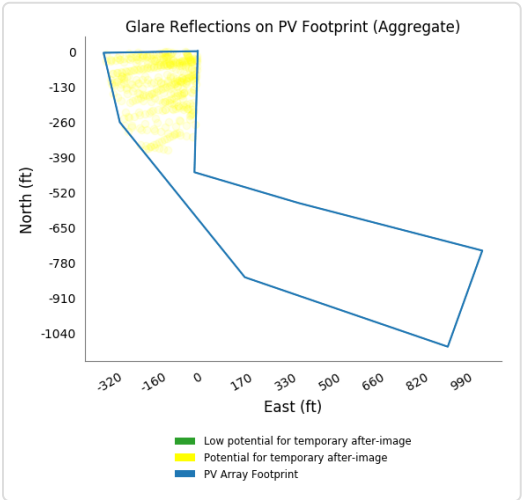
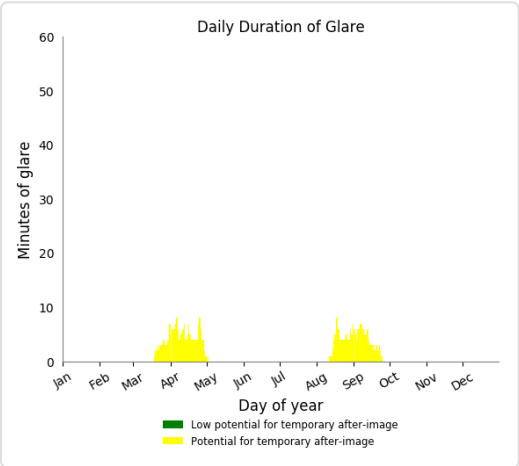
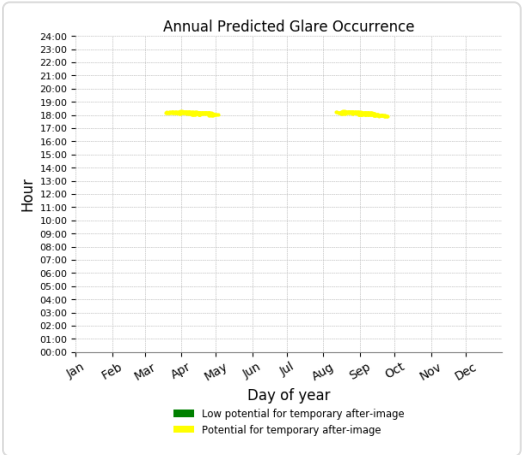
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 138 minutes of "yellow" glare with potential to cause temporary after-image.



PV array 2 - OP Receptor (OP 4)

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.
- 391 minutes of "yellow" glare with potential to cause temporary after-image.

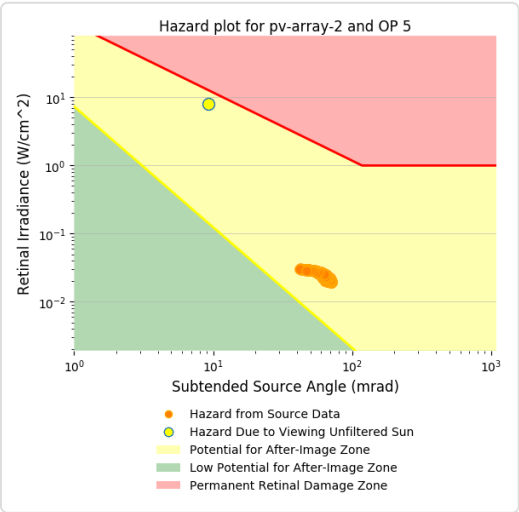
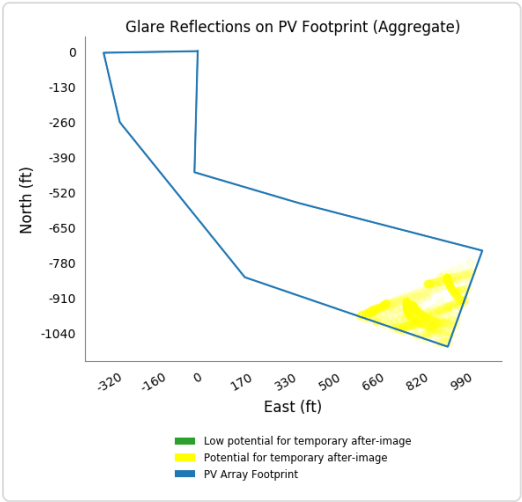
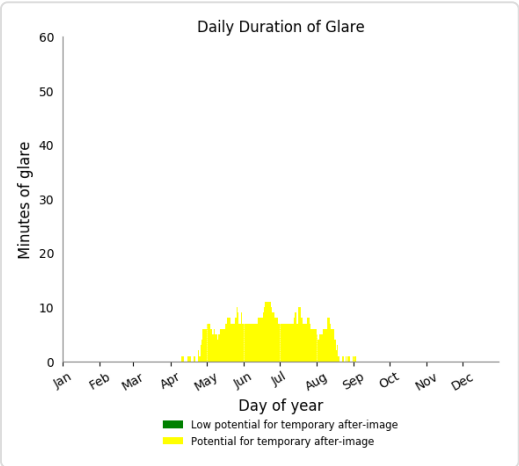
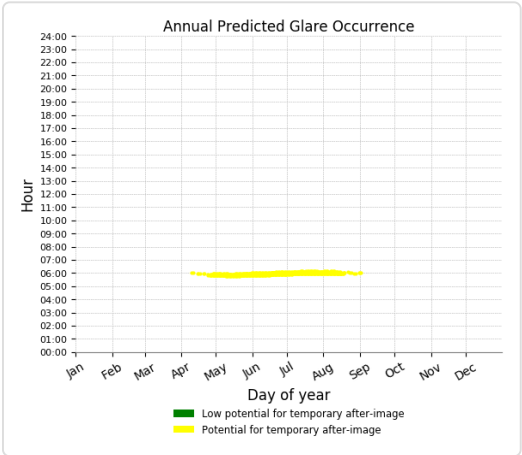




PV array 2 - OP Receptor (OP 5)

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

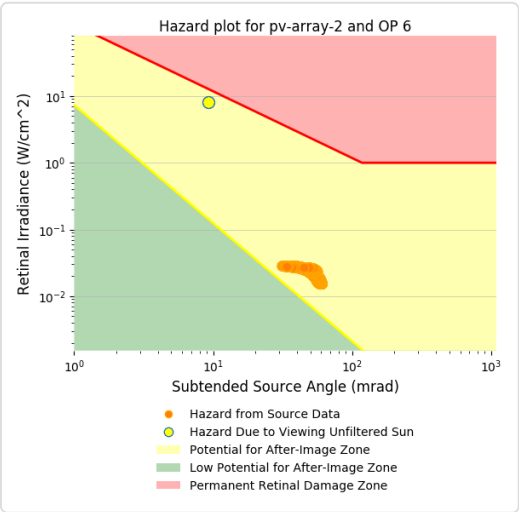
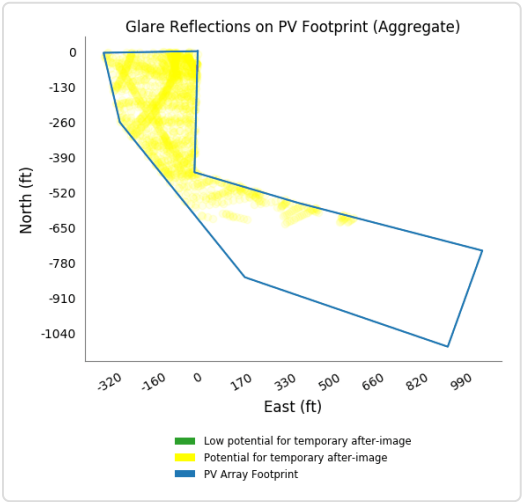
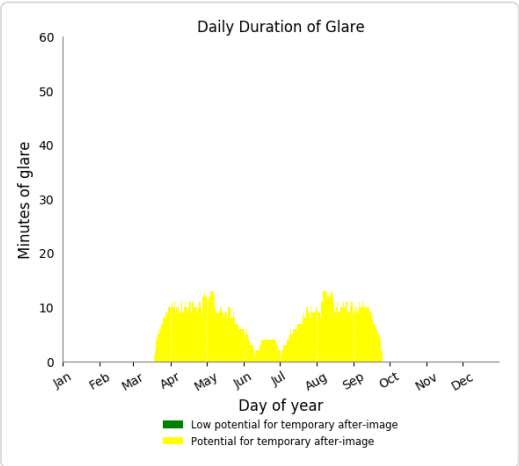
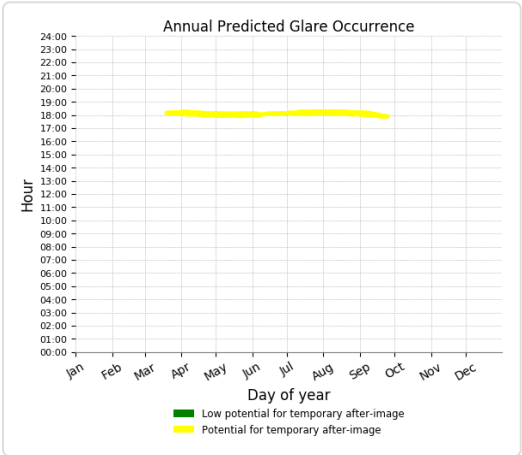
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 824 minutes of "yellow" glare with potential to cause temporary after-image.



PV array 2 - OP Receptor (OP 6)

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

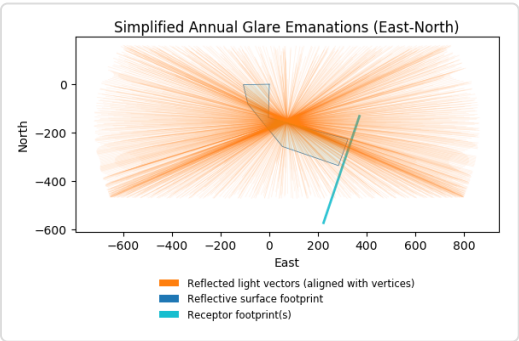
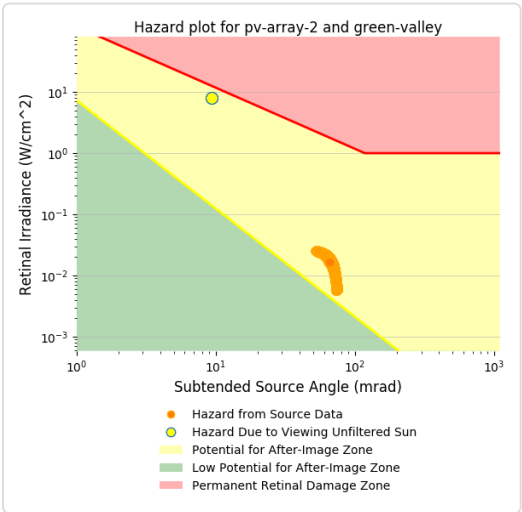
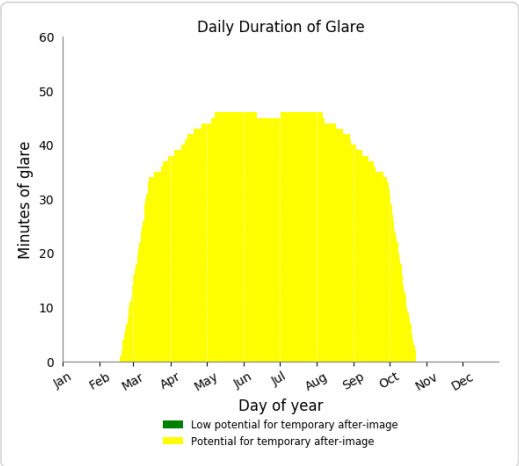
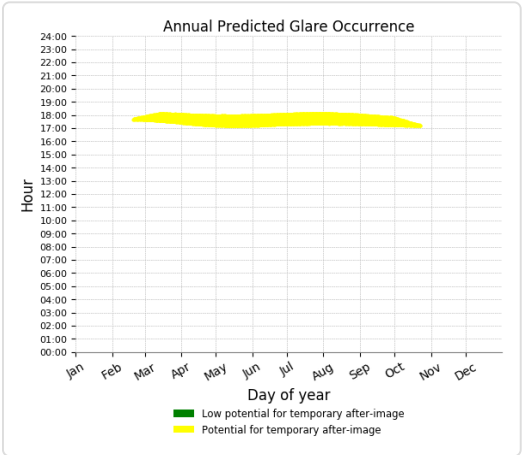
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 1,514 minutes of "yellow" glare with potential to cause temporary after-image.



PV array 2 - Route Receptor (Green Valley Road)

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.
- 9,259 minutes of "yellow" glare with potential to cause temporary after-image.



Glare vectors placed at PV centroid for clarity. Actual glare-spot locations vary.

PV array 3 potential temporary after-image

Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	16
OP: OP 5	0	5419
OP: OP 6	3	450
Route: Green Valley Road	0	5710

PV array 3 - OP Receptor (OP 1)

No glare found

PV array 3 - OP Receptor (OP 2)

No glare found

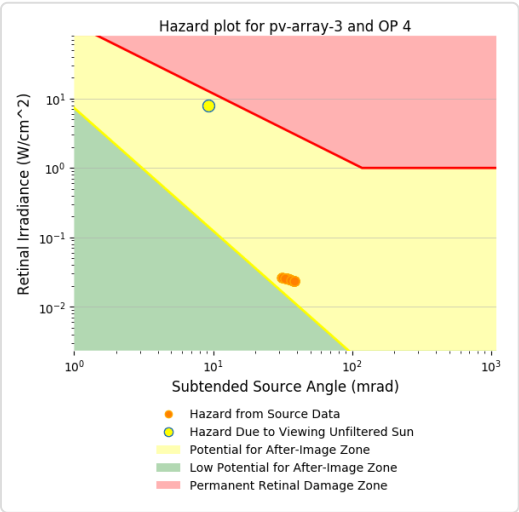
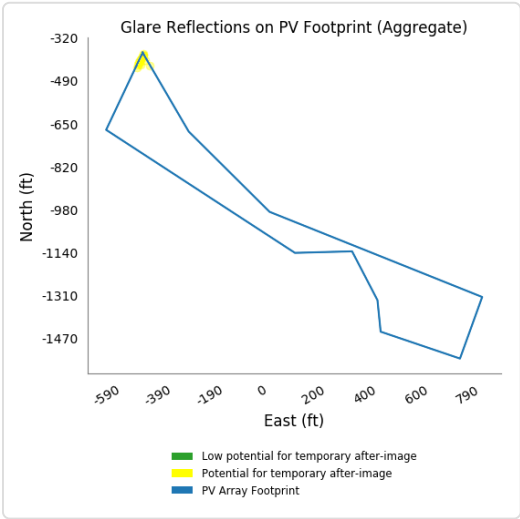
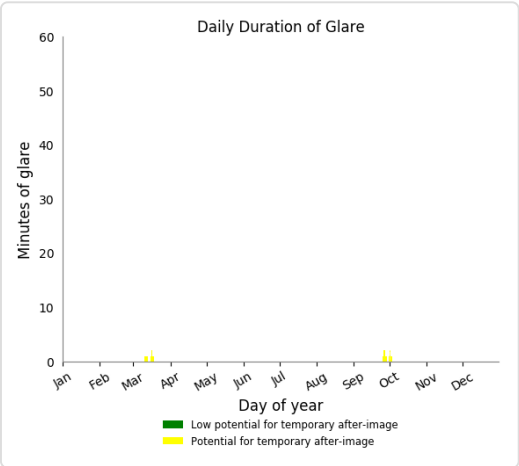
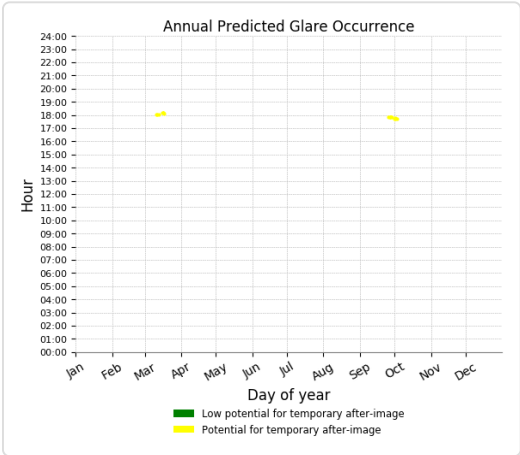
PV array 3 - OP Receptor (OP 3)

No glare found

PV array 3 - OP Receptor (OP 4)

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

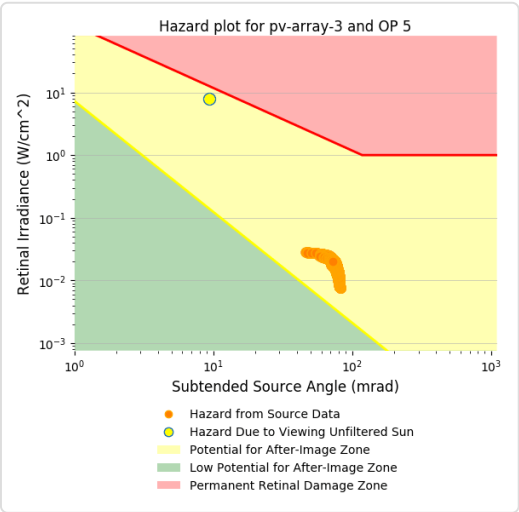
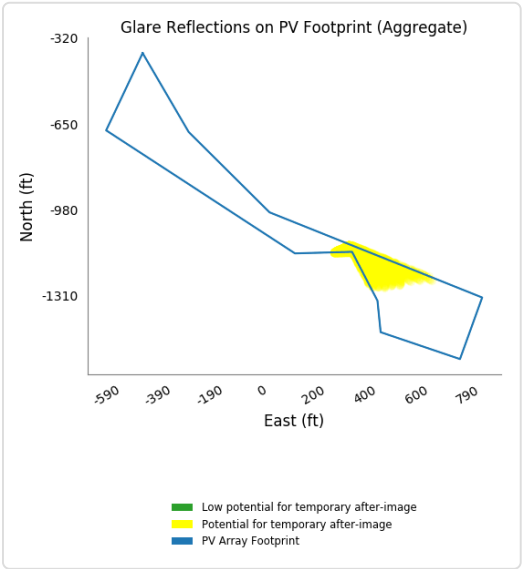
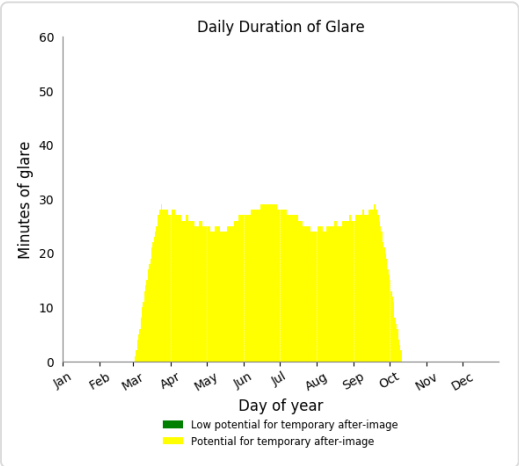
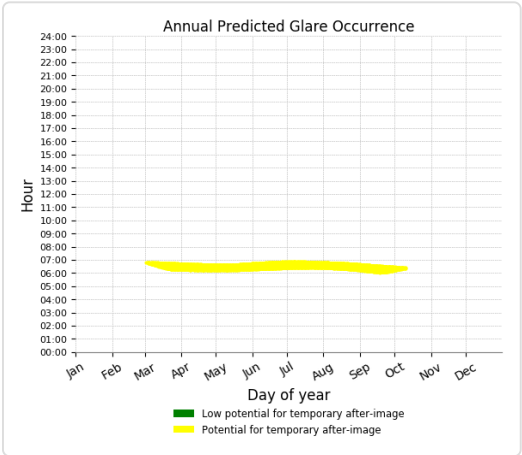
- 0 minutes of "green" glare with low potential to cause temporary after-image.
- 16 minutes of "yellow" glare with potential to cause temporary after-image.



PV array 3 - OP Receptor (OP 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.
- 5,419 minutes of "yellow" glare with potential to cause temporary after-image.

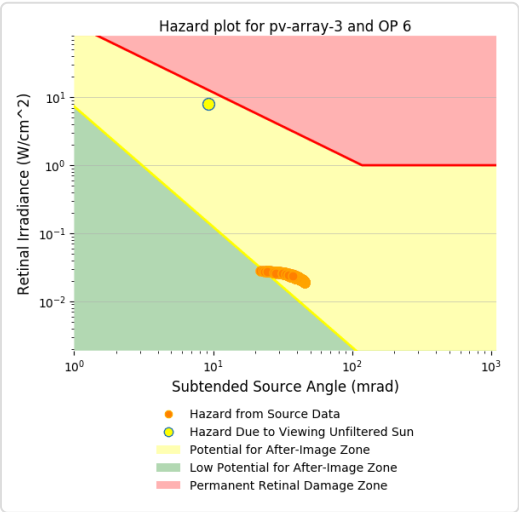
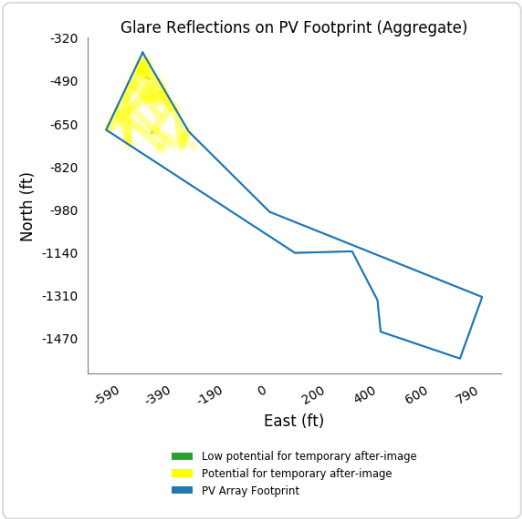
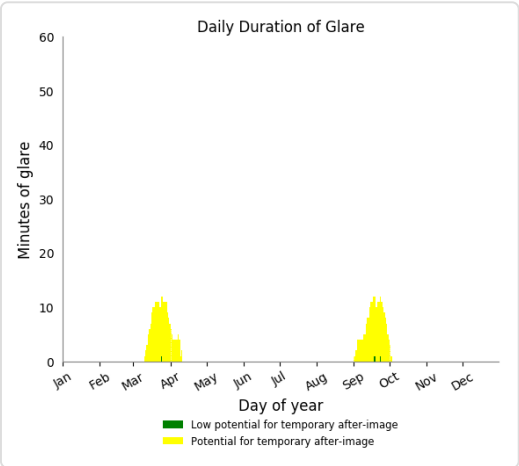
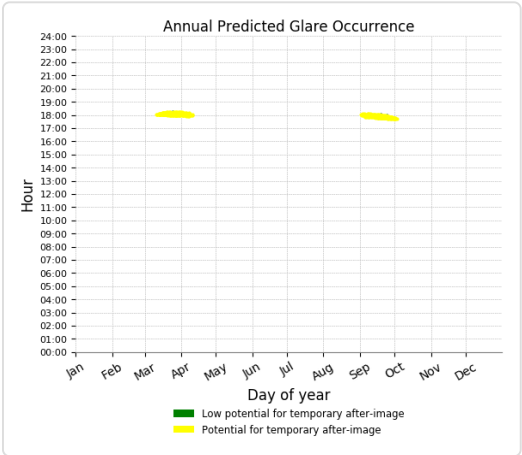




PV array 3 - OP Receptor (OP 6)

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

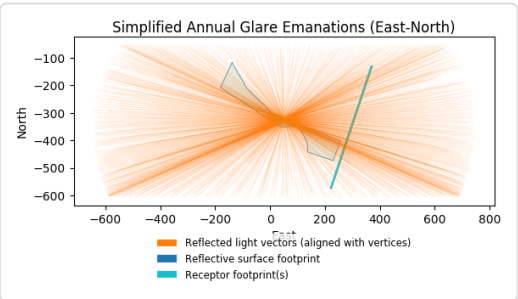
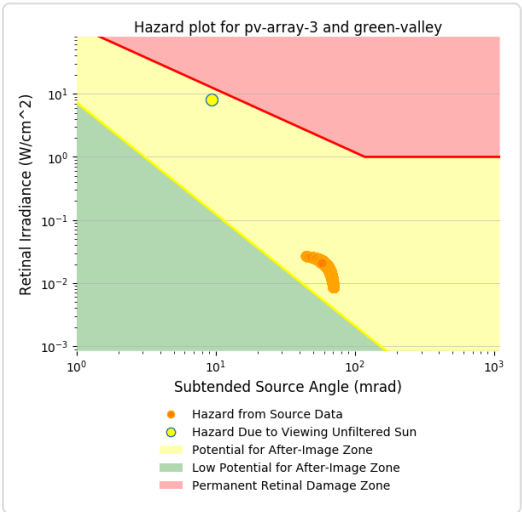
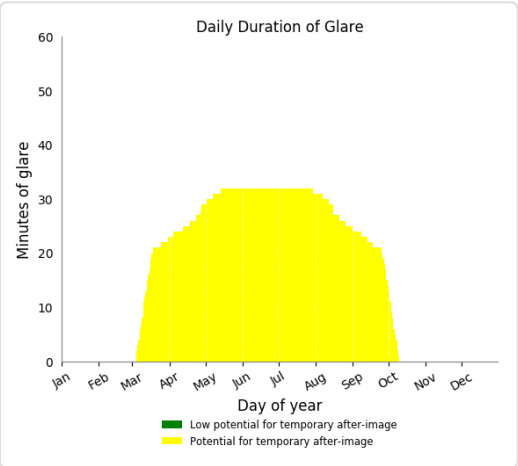
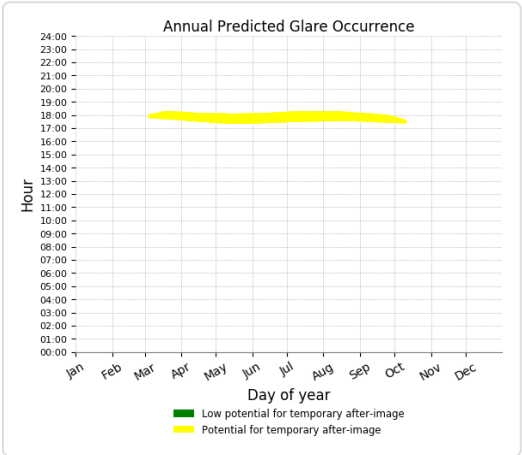
- 3 minutes of "green" glare with low potential to cause temporary after-image.
- 450 minutes of "yellow" glare with potential to cause temporary after-image.



PV array 3 - Route Receptor (Green Valley Road)

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.
- 5,710 minutes of "yellow" glare with potential to cause temporary after-image.



Glare vectors placed at PV centroid for clarity. Actual glare-spot locations vary.

**PV array 4** potential temporary after-image

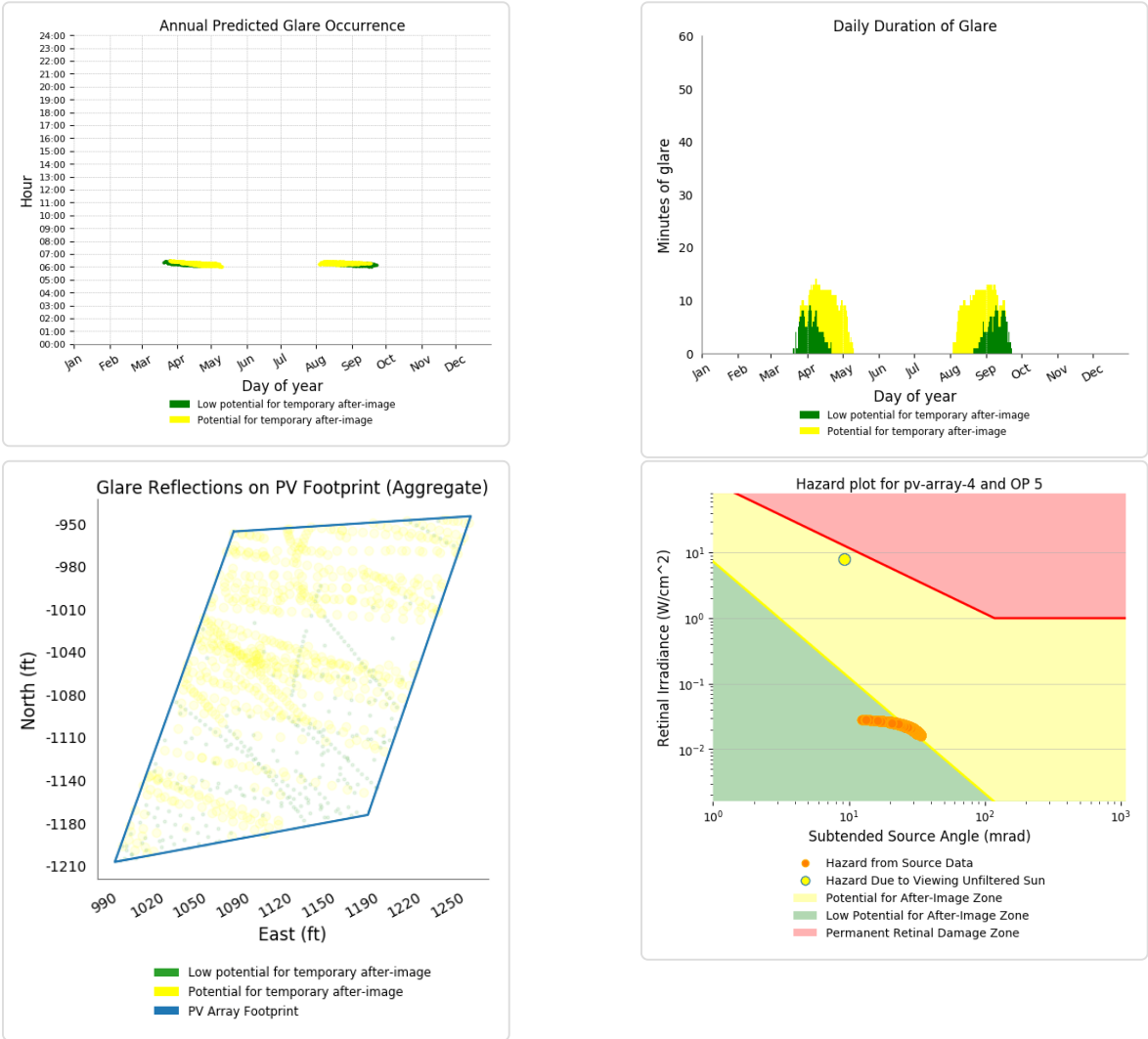
Component	Green glare (min)	Yellow glare (min)
OP: OP 1	0	0
OP: OP 2	0	0
OP: OP 3	0	0
OP: OP 4	0	0
OP: OP 5	309	638
OP: OP 6	0	0
Route: Green Valley Road	0	12249

**PV array 4 - OP Receptor (OP 1)***No glare found***PV array 4 - OP Receptor (OP 2)***No glare found***PV array 4 - OP Receptor (OP 3)***No glare found***PV array 4 - OP Receptor (OP 4)***No glare found*

PV array 4 - OP Receptor (OP 5)

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

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



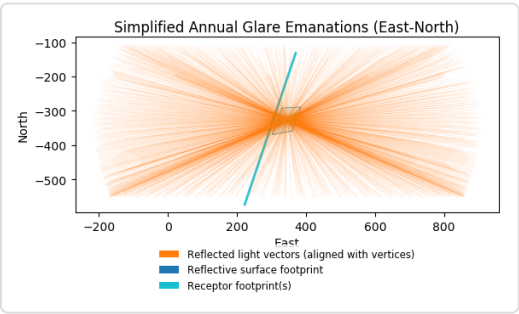
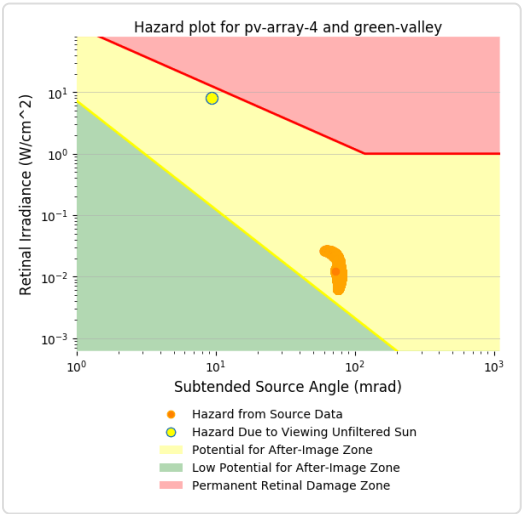
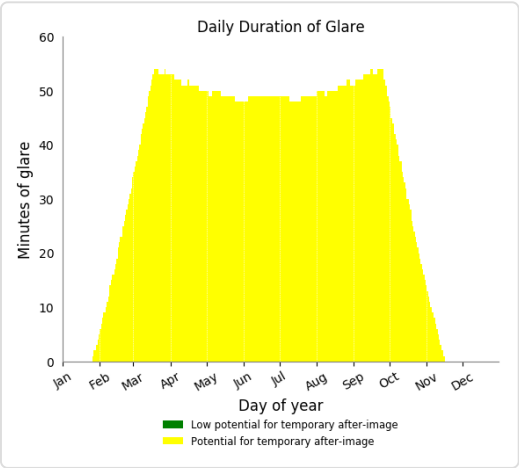
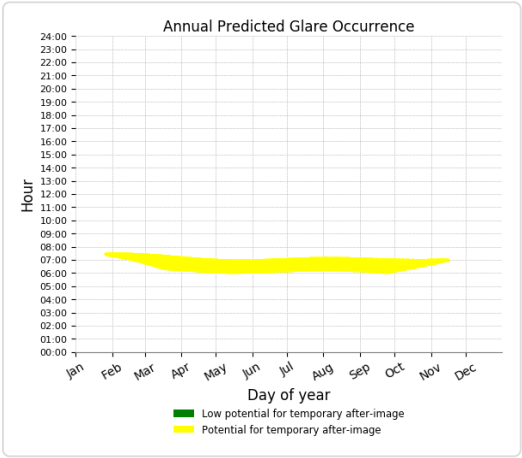
PV array 4 - OP Receptor (OP 6)

No glare found

PV array 4 - Route Receptor (Green Valley Road)

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.
- 12,249 minutes of "yellow" glare with potential to cause temporary after-image.



Glare vectors placed at PV centroid for clarity. Actual glare-spot locations vary.

## Assumptions

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- Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
- Detailed system geometry is not rigorously simulated.
- The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual values and results may vary.
- Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
- The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
- Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass : continuous, not discrete, spectrum.
- Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
- Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
- Refer to the **User's Manual** for assumptions and limitations not listed here.



*Appendix C*  
*Heart of the Civil War Heritage Area Letter*



Mr. Fred Kelley  
Power Plant Research Program  
Department of Natural Resources  
580 Taylor Ave., B-3  
Annapolis, MD 21401

Re: Citizens UB Solar, LLC – Union Bridge Solar Project (PSC Case 9483)

June 28, 2019

Dear Mr. Kelley,

The Carroll County Advisory Council to the Heart of the Civil War Heritage Area met yesterday and reviewed the above referenced project. We agree with the MHT finding that there is a potential for adverse effects associated with this project if mitigation efforts are not explored. It is also believed there may be previously unidentified adverse effects related to the roadway as a pass through for troops *en route* to Gettysburg. We offer these suggestions related to mitigation strategies:

**Enhanced and additional landscape buffering** – we concur with the recommendation discussed at the June 4 meeting at DNR.

**Entry into the Historic District** – as the project will impact the entry into the historic district, we suggest some additional signage or wayside interpretation that communicates the fact that travelers are entering a historic district.

**Kilfadda (CARR 948)** - we suggest that mitigation include the cost of nominating Kilfadda to the National Register.

**Toll House (CARR 1546)**– “Mitigation by avoidance” is the suggestion here – the area of the Union Bridge Toll House that once stood along the turnpike from Libertytown to Union Bridge should be avoided.

**Troop movements** - The II and V Corps marched through Union Bridge on the way to Gettysburg. We suggest additional archaeological investigation using metal detectors to identify Civil War related material that would not have been picked up in the initial investigation. Attached is an illustration from *Just South of Gettysburg: Carroll County Maryland in the Civil War (1997)* and a pdf file that shows a Civil War Trails Marker (with inset map) that is in Union Mills.

Thank you for providing us with the opportunity to offer suggested mitigation strategies.

Sincerely,

Elizabeth Scott Shatto  
Executive Director

**CARROLL  
COUNTY**  
HAMPSTEAD  
MANCHESTER  
MOUNT AIRY  
NEW WINDSOR  
SYKESVILLE  
TANEYTOWN  
UNION BRIDGE  
WESTMINSTER

**FREDERICK  
COUNTY**  
BRUNSWICK  
BURKITTSVILLE  
EMMITSBURG  
FREDERICK  
MIDDLETOWN  
MOUNT AIRY  
MYERSVILLE  
NEW MARKET  
ROSEMONT  
THURMONT  
WOODSBORO

**WASHINGTON  
COUNTY**  
BOONSBORO  
CLEAR SPRING  
FUNKSTOWN  
HAGERSTOWN  
HANCOCK  
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