

December 1, 2023

Mr. Andrew Johnston
Executive Secretary
Maryland Public Service Commission
6 St. Paul Street, 16th floor
Baltimore, Maryland 21202

Re: PC58, *Request for comments on CPCN applications for utility-scale solar energy siting*

The Advocates for Herring Bay (AHB)¹ appreciate the opportunity to offer our comments on the questions posed in the Commission's November 9, 2023, notice of a public conference addressing CPCN applications for utility-scale solar energy siting. AHB is participating in this proceeding because of our interest in policies that will optimize the ecological and social benefits of efforts to decarbonize Maryland's electricity grid. Our comments focus on three topics:

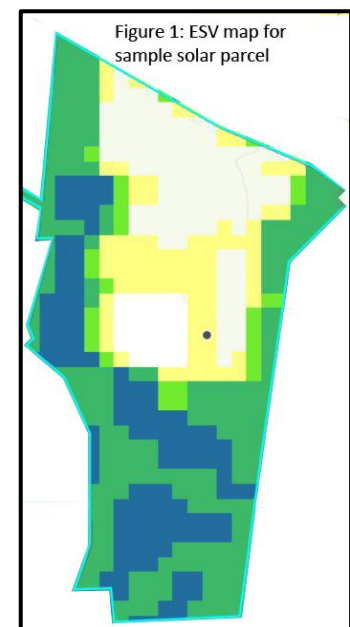
- Issue 2: ways applicants can avoid impacting environmentally significant assets
- Issue 5: ways applicants can adequately address soil erosion, and
- Issue 1: ways to facilitate consistency between applications and local priorities

Ways CPCN applicants can avoid impacting sites with environmental significance (Issue 2)

CPCN applicants can avoid impacting environmentally significant sites by using publicly available data developed by the Maryland Department of Natural Resources (DNR). The department's cutting-edge analysis of the "ecosystem services" provided by land across the state has been synthesized into a mapping tool that can be accessed on its [Greenprint](#) GIS website. Using this tool would be consistent with federal initiatives to expand the use of natural resource accounting.²

DNR's ecosystem services valuation (ESV) analysis quantifies the benefits gained by the public from the environment. Its 2020 assessment estimated a public value of \$8 billion annually from natural lands in Maryland, reflecting the value of seven ecosystem services: stormwater mitigation and flood prevention, groundwater recharge, surface water protection, wildlife habitat and biodiversity protection, nitrogen removal, carbon sequestration, and air pollution reduction.³ A review by AHB of 10 parcels slated for community solar projects in the Baltimore-Washington area found that water-related benefits accounted for over 70 percent of their ESV.⁴

The *Greenprint* mapping tool allows CPCN applicants to quickly screen sites for their environmentally significant features. Its color-coded maps identify highly valuable acreage in shades of blue and green, giving visual cues about acreage that should be avoided because of its high ESV. As shown in the ESV map of a proposed CPCN property in Figure 1, DNR's tool can help developers choose areas within a parcel that may be suitable for siting arrays because of their lower ecological significance, such as the area shaded in white.



¹ The Advocates for Herring Bay is a community-based environmental group in Anne Arundel County.

² See The White House, [Natural-Capital-Accounting-Strategy](#), January 2023.

³ See Elliott Campbell, Rachel Marks, and Christine Conn, [Spatial Modelling of the Biophysical and Economic Values of Ecosystem Services in Maryland, USA](#) in *Ecosystem Services*, Vol.43, June 2020.

⁴ See AHB presentation to [Chesapeake Bay Program, Local Government Advisory Committee](#), September 2023.

Using DNR’s ESV data would give applicants and the Commission data that are credible, consistent, and easily verifiable for all proposed projects. Advances in satellite imagery and AI techniques are expected to yield more precise estimates and maps in the future. Thus, AHB believes DNR’s ESV estimates and maps would be an effective way for the Commission and applicants to assess whether proposed project sites are likely to avoid ecologically valuable acreage.

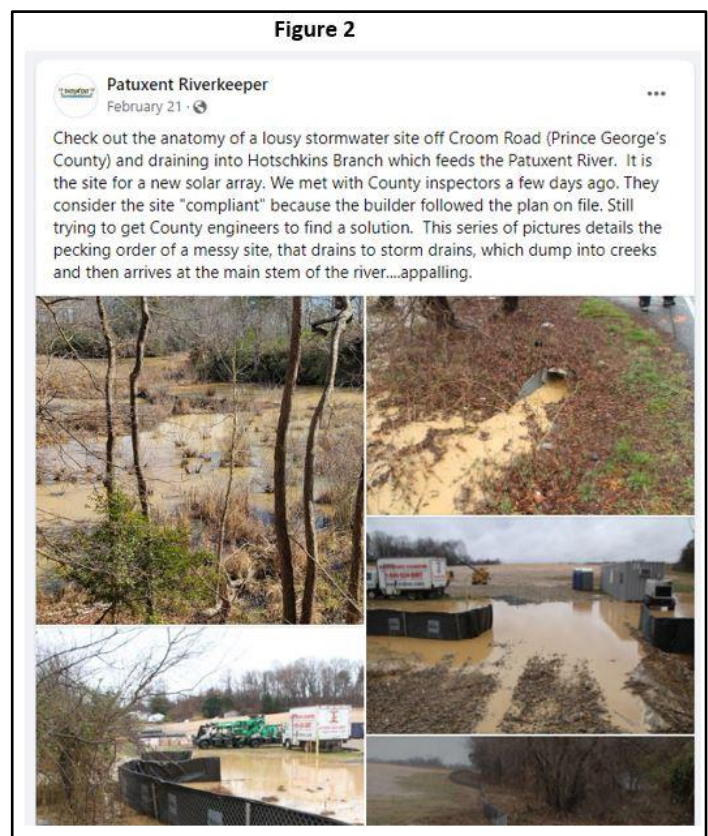
Finally, AHB supports encouraging applicants to supplement the ESV analysis with consultations with local environmental and community organizations who can provide insights into the importance of those ecological features to the health of their watersheds and communities.

Recommended language: Applicants for a CPCN shall avoid negatively impacting sites of environmental significance. Applicants shall demonstrate their intent to avoid negatively impacting environmentally significant sites by providing a map of the ecosystem services valuations shown on DNR’s Greenprint GIS for the parcel and for the area within the fence line.

Ways CPCN applicants can adequately address soil erosion (Issue 5)

AHB applauds the Commission for calling attention to the issue of soil erosion from ground-mounted solar arrays. Maryland’s solar-specific stormwater laws and guidelines were written more than a decade ago, before the state began experiencing more severe consequences of climate change, such as more intense rain events. Erosion documented in 2023 by the Patuxent Riverkeeper—shown in Figure 2—suggests that current industry practices may not be sufficient to protect neighbors and waterways from “lousy stormwater” practices at some solar sites.

Presentations at a recent conference convened by the Chesapeake Bay Program addressed some of the challenges and opportunities for managing runoff from solar arrays.⁵ The conference included a review of a federally funded modelling effort known as “PV-SMaRT,” which is being developed by the National Renewable Energy Lab (NREL) and the Great Plains Institute (GPI) to estimate the key drivers of runoff from solar projects.⁶



That research and related experience points to three actions that should be taken by CPCN applicants to effectively mitigate stormwater runoff and erosion:

⁵ See the proceedings of the April 2023 Scientific and Technical Advisory Committee’s conference on [Best Management Practices to Minimize Impacts of Solar Farms on Landscape Hydrology and Water Quality](#)

⁶ See Great Plains Institute, [Best Practices: Photovoltaic Stormwater Management Research and Testing \(PV-SMaRT\)](#), January 2023.

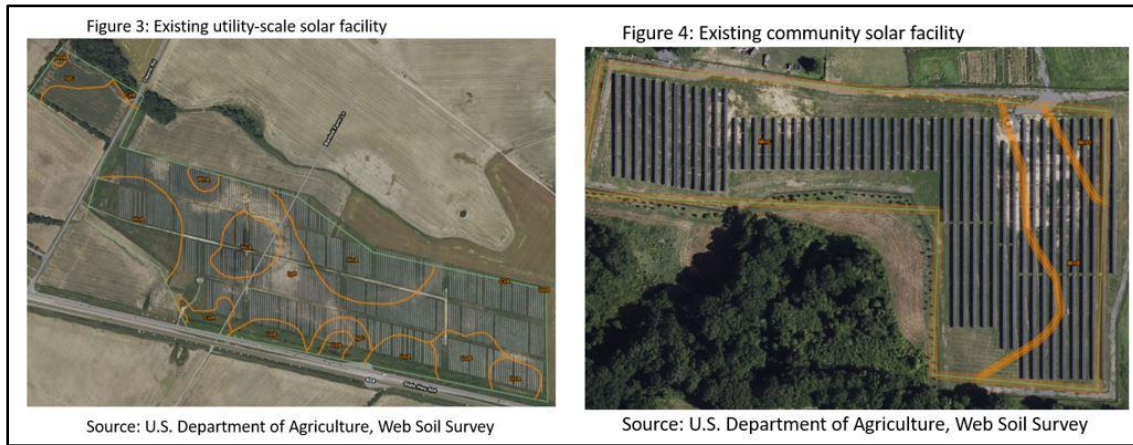
1. CPCN applicants should accurately estimate potential runoff at each site. Table 1, shown below, was developed using the PV-SMaRT calculator to show how estimated runoff differs under varied environmental conditions.⁷ The results indicate that CPCN applicants should stress-test their runoff estimates for bigger rain events; account for the density of the soil at each site; and include the effects of the panels themselves in the calculations. The PV-SMaRT model also suggests that some runoff can be absorbed by vegetative ground covers under and around the panels, especially well-established deep-rooted grasses.

2. CPCN applicants should address stormwater mitigation at the front end of the development cycle. In contrast to conventional projects that add impervious surfaces, ground-mounted solar facilities retain pervious, vegetated surfaces under and around the panels. Those vegetated surfaces have the potential to absorb runoff, but realizing that potential takes planning and effort. For example, the NREL-GRI report recommends measuring the density of the soil prior to construction and devising ways to minimize compaction during the construction process. The report also suggests limiting the removal of soil and vegetation prior to construction; using low-impact development methods; de-compacting the soil after initial construction if necessary to restore the infiltrative capacity of the soil; and seeding the site before installing the panels.

3. CPCN applicants should invest in continuous monitoring and maintenance to sustain the infiltrative capacity of the vegetation over the multi-decade life of their solar generation facility. Without due diligence, projects may experience a loss of vegetative cover in some areas, which undermines the integrity of the nature-based mitigation measures. Patchy growth is already an issue for some existing Maryland solar projects, as shown in Figures 3 and 4 on the next page. Because ownership of solar projects can change frequently, CPCN applicants should provide advance funding, deposited in escrow accounts, for regular monitoring of the health of the vegetated ground cover and restoring it when necessary.

Table 1						
Estimates of runoff using NREL-Great Plains Institute's "PV-SMaRT program calculator						
Inches of rain in 24 hour period	Bulk soil density before construction			Bulk soil density after construction		
	1	2	3	1	2	3
	Est. runoff in inches			Est. runoff in inches		
<u>Scenario: Site with no solar panels, with uniform ground cover of turf grass</u>						
No panels - 0% to 5% slope	0.00	0.00	0.08	0.05	0.47	1.11
No panels - 6% to 10% slope	0.00	0.00	0.08	0.05	0.47	1.11
No panels - 11% to 15% slope	0.00	0.01	0.16	0.16	0.77	1.55
<u>Scenario: Site including the effects of solar panels, with uniform ground cover of turf grass</u>						
With solar panels - 0% to 5% slope	0.00	0.02	0.20	0.22	0.90	1.73
With solar panels - 6% to 10% slope	0.00	0.02	0.20	0.22	0.90	1.73
With solar panels - 11% to 15% slope	0.00	0.05	0.32	0.47	1.34	2.28
<u>Scenario: Site including the effects of solar panels, with uniform ground cover of newly established pollinator plants</u>						
With solar panels - 0% to 5% slope	0.00	0.00	0.06	0.11	0.65	1.38
With solar panels - 6% to 10% slope	0.00	0.00	0.06	0.11	0.65	1.38
With solar panels - 11% to 15% slope	0.00	0.00	0.14	0.27	1.01	1.87
<u>Scenario: Site including the effects of solar panels, with uniform ground cover of mature prairie grass</u>						
With solar panels - 0% to 5% slope	0.00	0.00	0.00	0.04	0.42	1.02
With solar panels - 6% to 10% slope	0.00	0.00	0.00	0.04	0.42	1.02
With solar panels - 11% to 15% slope	0.00	0.00	0.03	0.13	0.70	1.45
<u>Key parameters used in the PV-SMaRT calculator for these estimates:</u>						
Estimates assume pre-construction bulk soil density of 1.4 (some existing projects range from 1.3 to 1.6)						
Post-construction estimates assume that soil density increases by 0.2 (Source: Center for Watershed Protection)						
Estimates assume solar panel width of 10 feet, with panel spacing of 25 feet						

⁷ NREL's [overview of the PV-SMaRT program](#) includes a link to the PV-SMaRT calculator.



Recommended language: *To demonstrate that the applicant intends to adequately address the potential impacts of the ground-mounted solar arrays on soil erosion and stormwater runoff:*

- *The application for a CPCN shall include the following information:*
 - *the applicant’s calculation of runoff from the site before mitigation measures:*
 - *Including the effects of the solar panels themselves on runoff;*
 - *Assuming daily rainfall over a 24-hour period at levels of two inches and three inches;*
 - *Accounting for the bulk soil density at the proposed site before and after construction; and*
 - *Addressing all other factors considered in the calculation of runoff under standard estimating procedures for stormwater management.*
 - *descriptions of the vegetative ground cover to be established under the panels; and*
 - *descriptions of the vegetative ground cover to be established between the panels.*
- *If approved, an applicant shall be obligated to monitor the growth of the vegetative cover under and around the solar panels on an annual basis for at least the first three years of operation and every five years thereafter;*
- *If approved, an applicant shall be obligated to create and fund an escrow account with amounts sufficient to re-establish an effective vegetative ground cover under and around the panels over the operating life of the project.*

Ways the Commission could facilitate consistency between CPCN applications and local land use priorities (Issue 1)

The legalistic nature of zoning laws and comprehensive plans is necessary for enforcing local land-use policies, but it often fails to offer a holistic view of localities’ solar siting goals. Since 2019, AHB has expressed the view that our “county’s success in expanding solar energy will hinge on doing a study that would better inform policymakers, residents, and developers on siting options.” We have suggested that such studies include setting “a visionary but realistic target for in-county solar production,” a process that would help identify barriers and opportunities to develop solar on preferred sites.⁸

Having plans and guiding principles for each county/city would provide clarity on siting priorities for CPCN applicants while accounting for the diversity of resources, economies, and cultures in the respective jurisdictions. It also would align with the recommendations of the 2023 collaborative agreement between national industry and environmental groups, which cited the need to:

⁸ See [AHB recommendations on Solar Energy for Members of County Executive's Transition Team](#), January 2019.

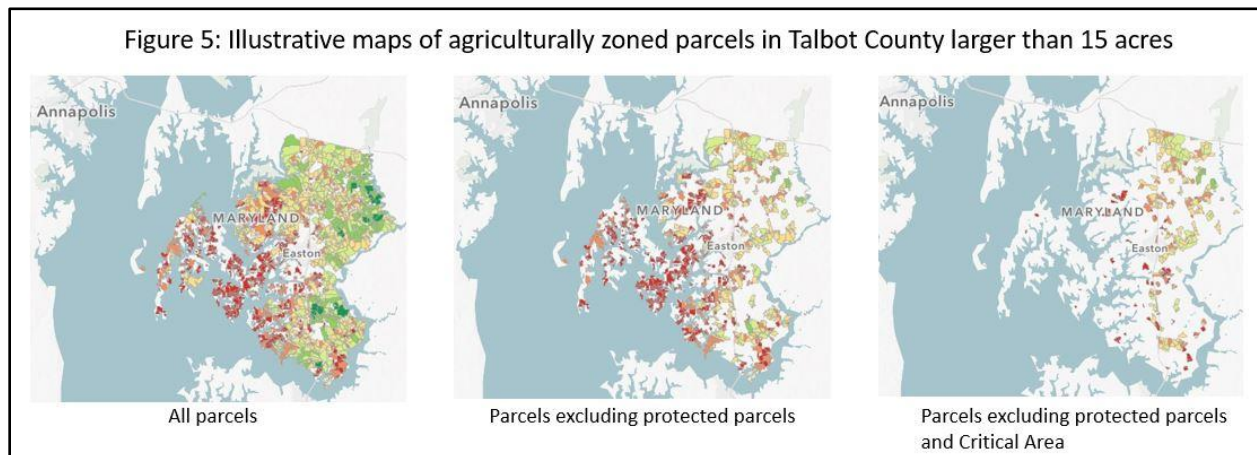
Develop a risk-assessment and decision-making framework and related best practices for large-scale solar siting.... The framework would include consideration of the “mitigation hierarchy”: avoid first; then minimize; then compensate, where appropriate....⁹

Doing such assessments takes time and funding—all of which may be in short supply when local governments are facing fiscal and other policy demands. Given the benefits to the CPCN application and review process, AHB believes it would be appropriate for the Commission to encourage and support efforts by local governments to analyze and adopt guiding principles tailored to the features of their areas.

Finally, we also urge the Commission to work with local governments to translate their guiding principles into geographically accessible formats. During deliberations on a framework for Talbot County, local officials had the benefit of a mapping tool that allowed them to assess the acreage available for solar under various criteria and scenarios.¹⁰ Figure 5, for example, illustrates the effect of excluding protected parcels (such as those under conservation or agricultural easements) and excluding both protected parcels and land in the Critical Area. Such maps benefit planners and policymakers, as well as developers seeking to avoid priority parcels. However, the ability to create applied mapping tools depends on the availability of relevant data, which may not exist in all cases.

Recommended action: *The Commission should engage with local governments to identify the form and content of solar siting plans that would ensure that CPCN applications are consistent with the land-use priorities of the local government. The Commission also should provide technical and financial assistance to local governments for the development of their solar siting frameworks, subject to the availability of appropriated funds or other budgetary resources.*

Thank you for considering our views. If you have any questions about our comments, please contact us at herringbay@gmail.com.



⁹ See Stanford University, [Collaboration Agreement on Large-Scale U.S. Solar Development](#), October 12, 2023, page 8.

¹⁰ The Chesapeake Bay Foundation (CBF) developed the mapping tool for planning purposes only and it does not directly or indirectly convey a position or policy position from CBF.