P.O. Box 1699
Plymouth, MA 02362
communitylandandwater.org
sandwars.org

May 27, 2025

To the Energy Facilities Siting Board,

Please accept comments from Community Land and Water Coalition relating to energy siting regulations and guidelines that are in development.

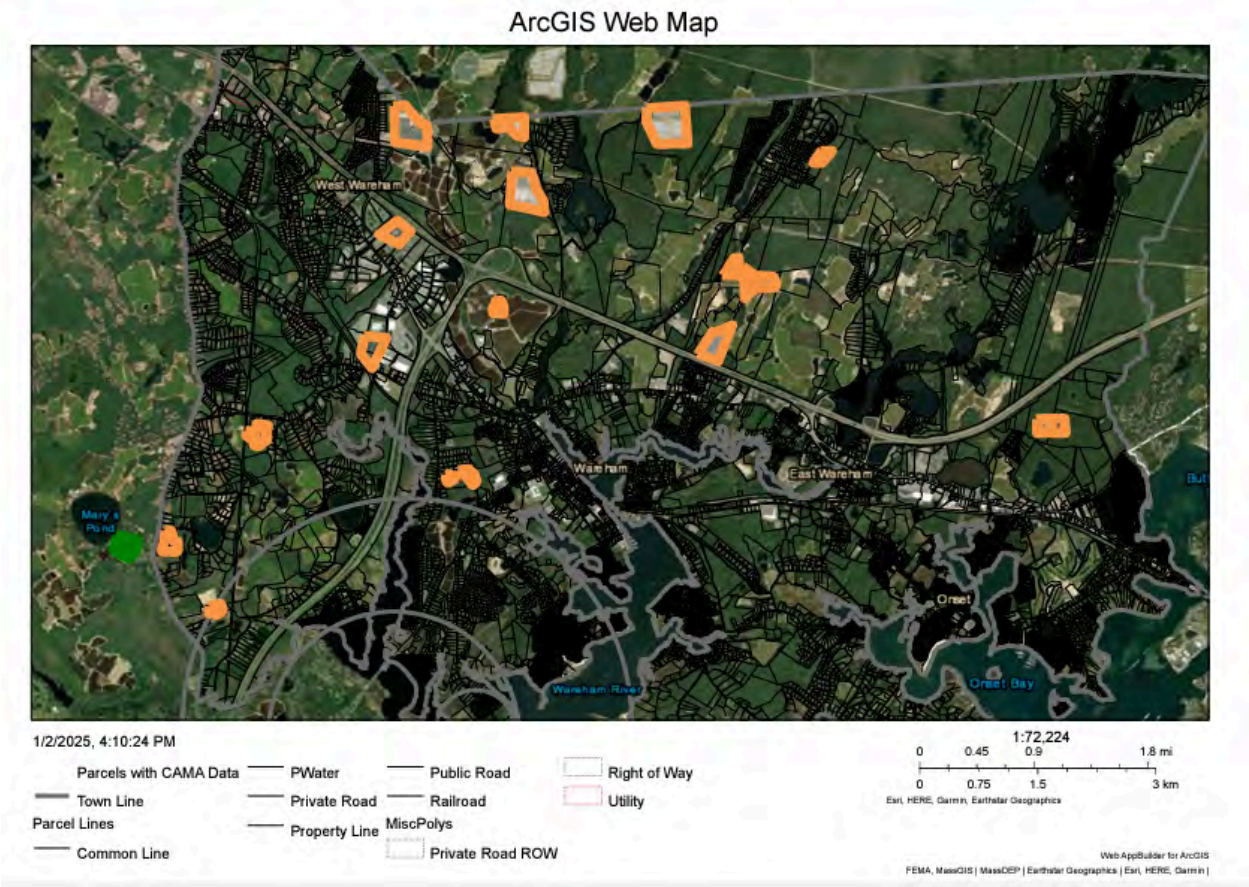
These comments are submitted by Community Land & Water Coalition (CLWC) on behalf of itself and its members who live, work and recreate in the towns of Southeastern Massachusetts, including those which source their drinking water from the Plymouth-Carver Sole Source Aquifer, who are aggrieved the State's current solar policies which allow unchecked deforestation and sand mining for solar on top of the Aquifer and throughout the Southeastern Massachusetts Coastal Pine Barrens which protect it. CLWC is a Massachusetts non-profit corporation organized exclusively for charitable, educational, and scientific purposes, including but not limited to research, outreach, and the dissemination of information about preserving, protecting, and stewarding land and water resources in Massachusetts. This includes the rare Pine Barrens ecosystem and its species, as well as the Southeastern Massachusetts' sole source aquifer (the Plymouth Carver Sole Source Aquifer). It achieves its mission in part by advocacy for responsible solar siting within our unique ecosystem and around our delicate drinking water source.

Please accept these comments relating to energy siting regulations and guidelines that are in development:

1. **Ground-mounted solar development has had a devastating impact on the biodiversity of Southeastern Massachusetts and threatens our drinking water supply.**

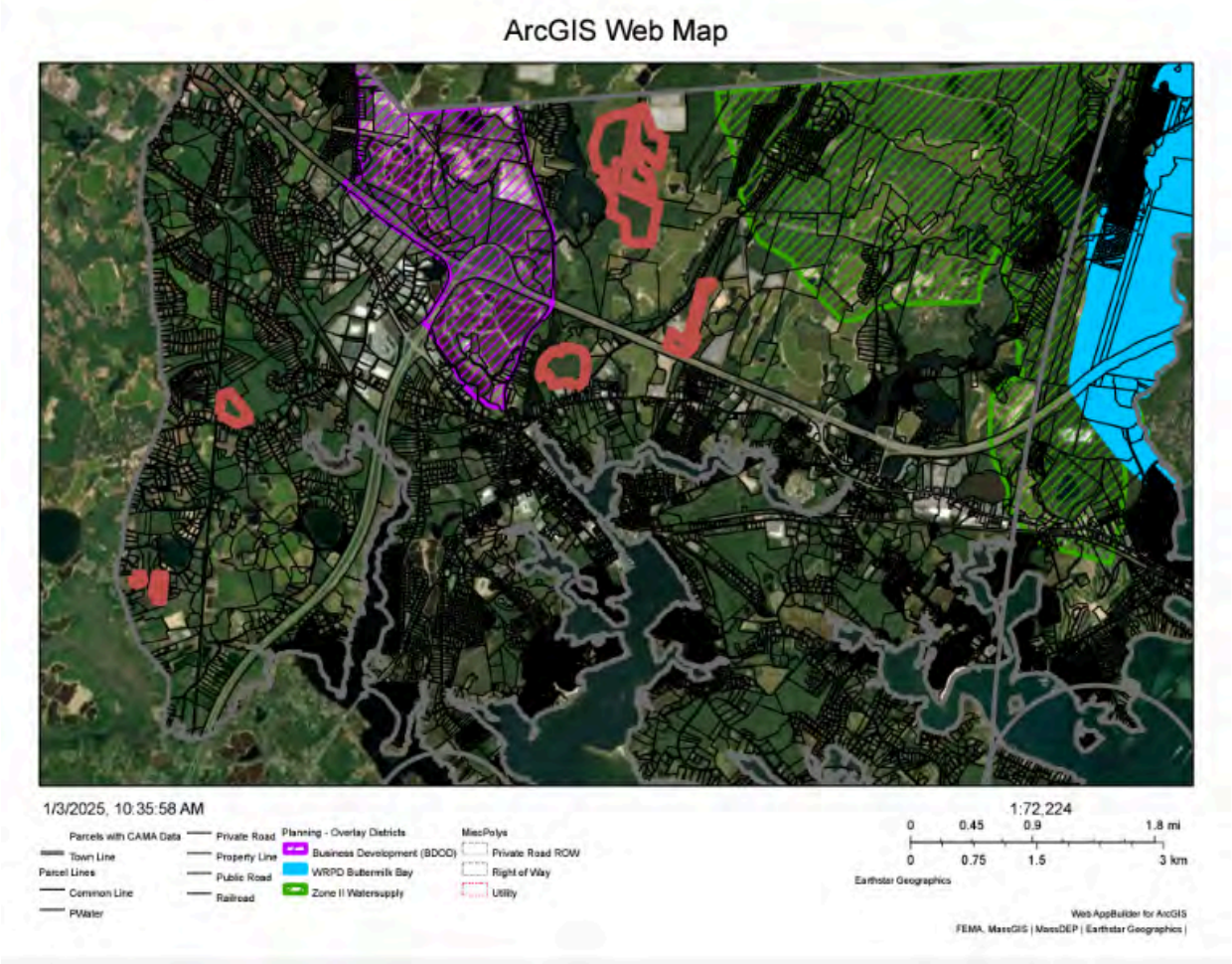
According to an analysis of aerial imagery by Community Land and Water Coalition, the Town of Wareham already has over 260 acres of ground-mounted solar on previously forested land. All of these projects, highlighted in orange below, have resulted in the loss of rare pine barrens forest, wildlife habitat, and biodiversity and most sit on top of the Plymouth-Carver Sole Source Aquifer, stripping the aquifer of the protective filtering capacity of the forest above. These solar projects have resulted in habitat fragmentation in environmentally sensitive areas.

*Map of existing large ground-mounted solar arrays in Wareham, outlined in orange below.*




This close up aerial image provided by Mass Audubon and Harvard Forest in their 2023, *Growing Solar, Protecting Nature*, shows the impact of large-ground mounted solar on the wildlife areas surrounding Myles Standish State Forest.

There are seven other proposed large ground-mounted solar projects in Wareham. These projects include 27 Charge Pond Road and 150 Tihonet Road, 140 Tihonet Road, 0 Route 25, 370 County Road, and 91 & 101 Fearing Hill Road. There is also a proposed solar array at 0 Tihonet Road. The total area of deforestation from these projects, if they get built, would be 278 acres. All of these proposed projects would involve deforestation of the rare Southeastern Massachusetts Pine Barrens, a globally rare ecosystem.

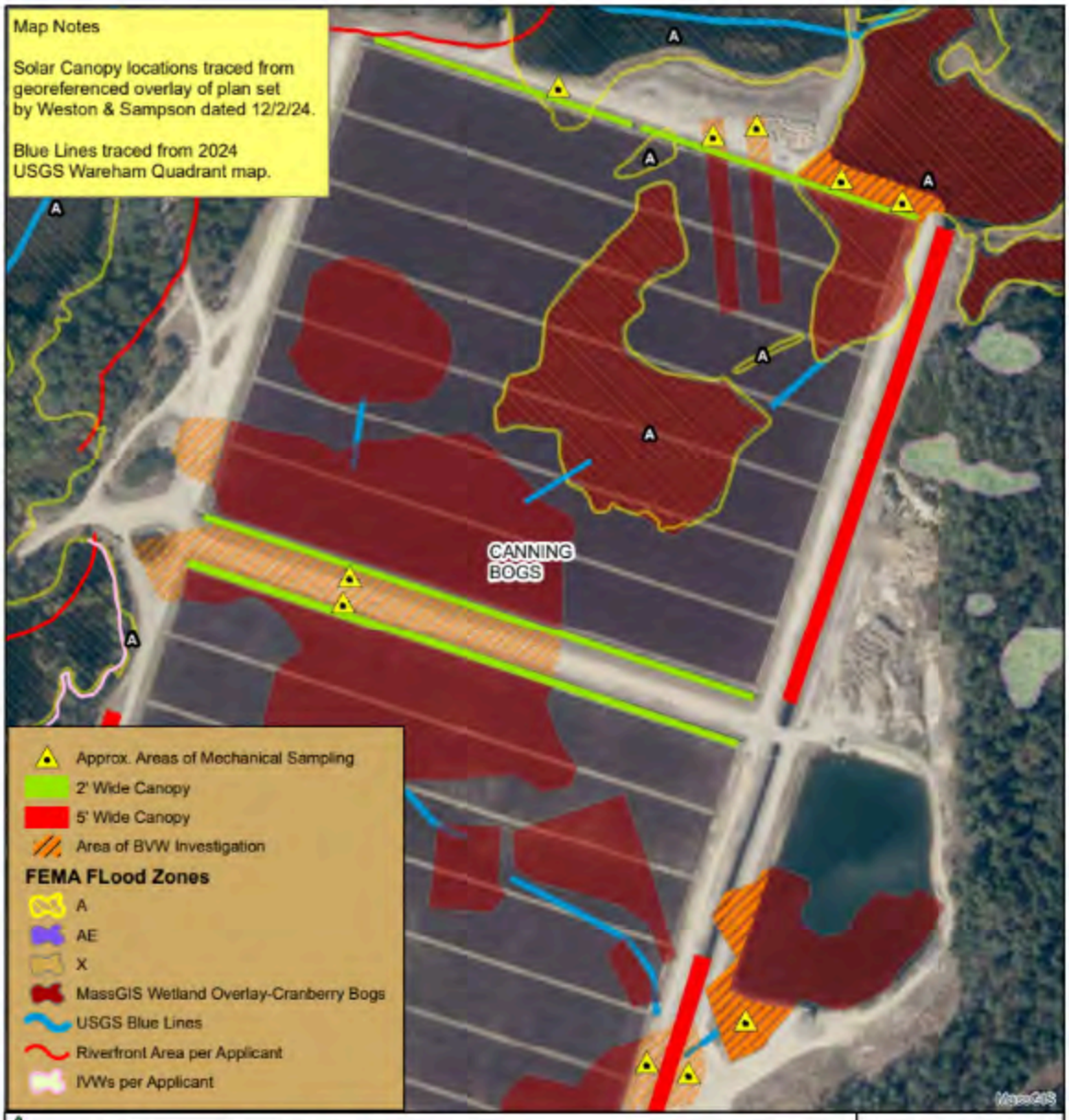



The below map shows a close up of only four of the seven proposed sites. If these sites were allowed to be built, they would destroy the last remaining wildlife corridor between Myles Standish State Forest and the Atlantic Ocean, destroying a rare ecosystem and dealing a devastating blow to the biodiversity of Southeastern Massachusetts.


2. **Solar canopies on agricultural canals create financial incentives for wetlands filling**

The A.D. Makepeace Company has applied for, and received local Conservation Commission and DEP approval for, two miles of solar canopies on the agricultural canals of cranberry bogs. In preparation for this application, the Makepeace Company illegally filled in and altered several acres of Bordering Vegetated Wetland, in areas where the canopies are now proposed. Makepeace's alteration of the historic BVW cranberry bogs on the Site has not been done in compliance with 310 CMR 10.04

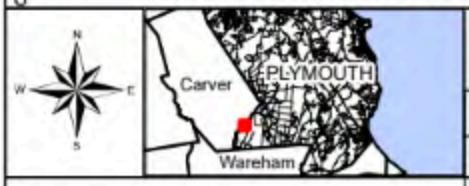
Agriculture(c)(1)(d). BVW was altered, and Bordering Land Subject to Flooding (BLSF) was filled, in direct violation of the Regulations. FEMA Zone A (the 100-year flood plain) is located within the subject cranberry bog, a portion of which was filled in the squaring-off operation. See the below map which indicates the extent of BVW filling in preparation for the canopy solar application. The state's solar policies currently create an incentive for the filling in of Bordering Vegetated Wetland.




ECOSYSTEM SOLUTIONS

Ecosystem Solutions, Inc.
100 Jefferson Blvd., Suite 225 Warwick, RI 02888

**EXHIBIT A**




PROPOSED AREAS OF INVESTIGATION/EXCAVATION - OVERALL
Matter of Renewable Energy Development Partners, LLC / OADR Docket no. WET-2024-036
Plymouth, Massachusetts

| | | | |
|---|---|---|---|
| DATE: | 2-28-25 | PROJECT #: | CB23-003 |
| CREATED BY: | BF | SCALE: | 1 inch = 300 feet |

2023 Color Aerial Photo

MASS GIS

0 150 300 600 900 Feet

3. **Current floating solar regulations are creating financial incentives for environmental destruction and sand mining in the form of the creation of new agricultural reservoirs.**

Because floating solar cannot be put on natural water bodies, this creates an incentive for larget land owners to transform parts of their landscape into unnatural water bodies and then put solar on them. Land owners are creating ponds and calling them agricultural activities, and then applying for floating solar. Numerous examples exist where there was no agricultural pond in existence, then the land owner deforested dozens of acres of pristine wildlife habitat, mined hundreds of cubic yards of sand, and then received financial subsidies for floating solar. These types of schemes, which are extremely environmentally destructive, should be carefully examined and not receive subsidies. See the attached slides, which were presented to the Massachusetts Association of Conservation Commission in 2023, for further information.

**As a result of the above information, we urge you to adopt the following into the new solar siting guidelines:**

1) "Small" energy projects and all Energy Storage System (ESS) battery systems should only be allowed on the built or disturbed environment. This is consistent with the recommendations of the Massachusetts Audubon and Harvard Forest report, Growing Solar, Protecting Nature, which analyzed how Massachusetts can meet its solar goals while protecting its most valuable natural and “working” lands.

2) The following areas should be excluded from large and small energy generation and transmission projects:

- Article 97 protected open space, including all Department of Conservation and Recreation state parks and reservations, state forests, watershed forests, and all Division of Fisheries and Wildlife state wildlife management areas. If these lands are

categorized as ineligible, an exception should be considered for solar canopies, such as solar panels over a public beach parking lot.

- “Wetland resource areas” (under 310 CMR 10.04), including setbacks of 1,000 feet from identified wetlands resources.

- Properties included in the State Register of Historic Places (950 CMR 71.03), except as authorized by regulatory bodies.

- Areas identified as Massachusetts BioMap 2 Critical Natural Landscapes, Core Habitats, Important Habitats, or Priority Habitats.

- Areas classified as Outstanding Resource Waters, wetlands or rivers.

- Flood plains or flood-prone areas.

- Sole Source Aquifers.

- Prime farmland (as defined by the state).

3) Ground-mounted solar projects should not be allowed on recently deforested land, defined as lands cleared less than 5 years ago. This is consistent with the recommendation of the Healey administration Carbon Forestry Committee, which concluded that keeping forests as forests is important in reducing carbon loss and mitigating climate change.

4) Marginal farmland should be minimally affected, with no decrease in agricultural productivity.

5) Language should be included that ensures no negative impacts on:

- Native biodiversity, including native plants and animals listed under the Massachusetts Endangered Species Act.

- Protected open space.

- Native American cultural areas, as determined by the Indigenous people of Massachusetts.

6) Power of discretion and authority should be provided to the towns that allows for:

- Locally created and enforceable safety standards for battery storage.

- Town-specific capacity and siting goals, with local control of siting.

- Authority for municipalities to reject any proposal for minimization and/or mitigation that is deemed to be a threat to the health, safety, and welfare of town citizens or to the protection of natural and cultural values in the town, as determined by local boards and commissions.

Thank you for the opportunity to comment on the proposed regulations and guidelines.

Sincerely,

Margaret Sheehan, Coordinator
Community Land and Water Coalition

**Attachments:**
MACC Presentation, March 4, 2023, prepared by Fred Bedall and Meg Sheehan

# MACC Presentation March 4, 2023

## Workshop D 3

Industrial Ground-Mounted Solar: Challenges Municipalities Face while Protecting Wetlands, Rivers, Forests and Farmlands

Fred Bedall - Meg Sheehan
environmentwatchsoutheasternma@gmail.com

# Why municipalities are on the front lines!

- Conservation Commission
- Planning Boards
- Zoning Board of Appeals
- Building Inspector

- “These projects are extraordinarily damaging”

  Partnership for Policy Integrity, 2021

- Typical project will cause increases in stormwater runoff, increased groundwater recharge, higher post development water table conditions

  Scott Horsley, Hydrologist, 2023

SCIENTIFIC REPORTS

OPEN

# The Photovoltaic Heat Island Effect: Larger solar power plants increase local temperatures

Received: 28 May 2016
Accepted: 23 September 2016
Published: 21 October 2016

Greg A. Barron-Gafford[1,2], Rebecca L. Minor[1,2], Nathan A. Allen[3], Alex D. Cronin[4], Adria E. Brooks[5] & Mitchell A. Pavao-Zuckerman[6]

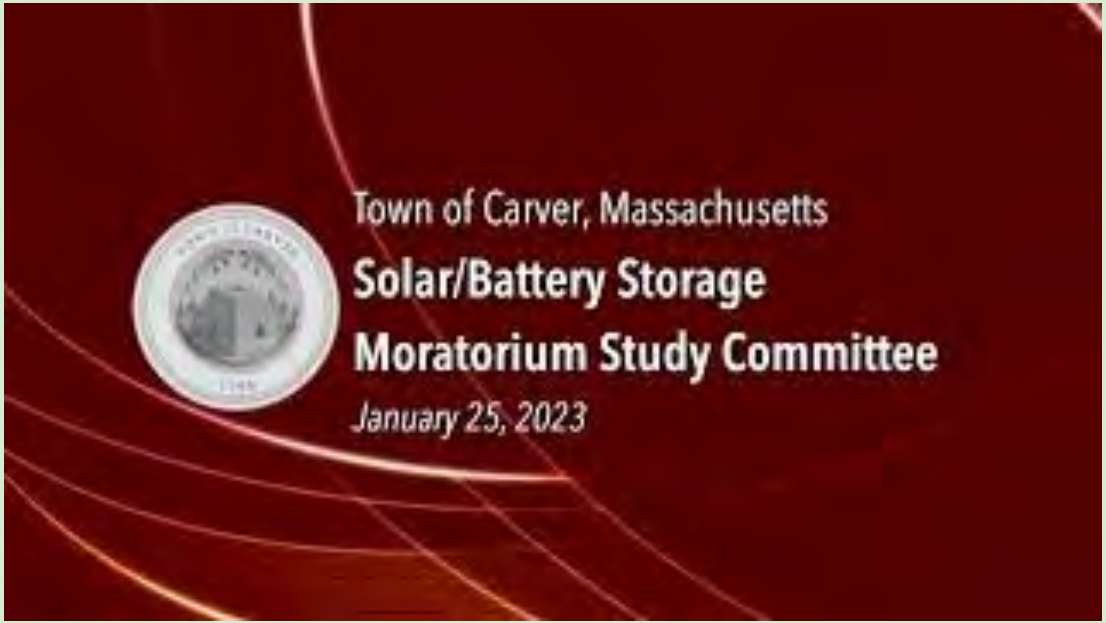
While photovoltaic (PV) renewable energy production has surged, concerns remain about whether or not PV power plants induce a "heat island" (PVHI) effect, much like the increase in ambient temperatures relative to wildlands generates an Urban Heat Island effect in cities. Transitions to PV plants alter the way that incoming energy is reflected back to the atmosphere or absorbed, stored, and re-radiated because PV plants change the albedo, vegetation, and structure of the terrain. Prior work on the PVHI has been mostly theoretical or based upon simulated models. Furthermore, past empirical work has been limited in scope to a single biome. Because there are still large uncertainties surrounding the potential for a PHVI effect, we examined the PVHI empirically with experiments that spanned three biomes. We found temperatures over a PV plant were regularly 3–4 °C warmer than wildlands at night, which is in direct contrast to other studies based on models that suggested that PV systems should decrease ambient temperatures. Deducing the underlying cause and scale of the PVHI effect and identifying mitigation strategies are key in supporting decision-making regarding PV development, particularly in semiarid landscapes, which are among the most likely for large-scale PV installations.

Electricity production from large-scale photovoltaic (PV) installations has increased exponentially in recent decades[1–3]. This proliferation in renewable energy portfolios and PV power plants demonstrate an increase in the acceptance and cost-effectiveness of this technology[4,5]. Corresponding with this upsurge in installation has been an increase in the assessment of the impacts of utility-scale PV[3,6–8], including those on the efficacy of PV to offset energy needs[9,10]. A growing concern that remains understudied is whether or not PV installations cause a "heat island" (PVHI) effect that warms surrounding areas, thereby potentially influencing wildlife habitat, ecosystem function in wildlands, and human health and even home values in residential areas[11]. As with the Urban Heat Island (UHI) effect, large PV power plants induce a landscape change that reduces albedo so that the modified landscape is darker and, therefore, less reflective. Lowering the terrestrial albedo from ~30% in natural deserts[12] to ~5% over PV panels[13] alters the energy balance of absorption, storage, and release of short- and longwave radiation[14,15]. However, several differences between the UHI and potential PVHI effects confound a simple comparison and produce competing hypotheses about whether or not large-scale PV installations will create a heat island effect. These include: (i) PV installations shade a portion of the ground and therefore could reduce heat absorption in surface soils[16], (ii) PV panels are thin and have little heat capacity per unit area but PV modules emit thermal radiation both up and down, and this is particularly significant during the day when PV modules are often 30 °C warmer than ambient temperatures, (iii) vegetation is usually removed from PV power plants, reducing the amount of cooling due to transpiration[17], (iv) electric power removes energy from PV power plants, and (v) PV panels reflect and absorb upwelling longwave radiation, and thus can prevent the soil from cooling as much as it might under a dark sky at night.

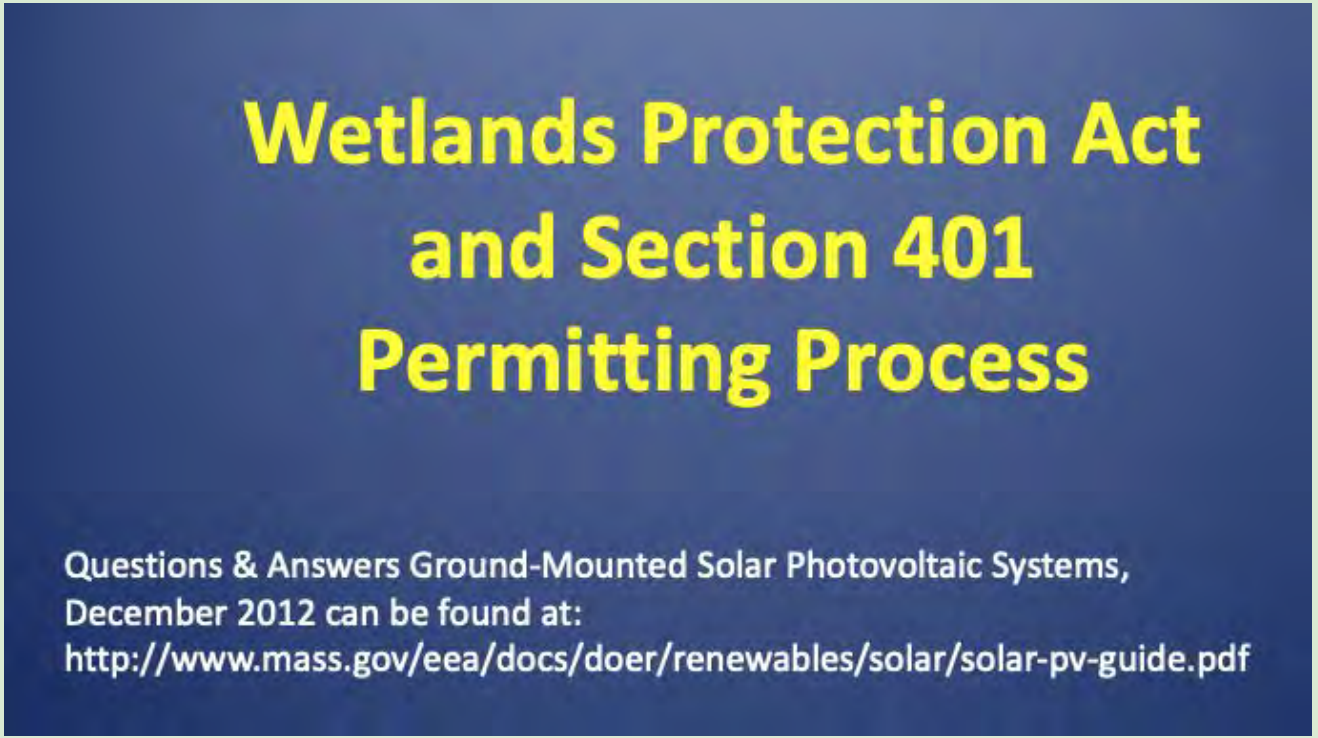
Public concerns over a PVHI effect have, in some cases, led to resistance to large-scale solar development. By some estimates, nearly half of recently proposed energy projects have been delayed or abandoned due to local opposition[11]. Yet, there is a remarkable lack of data as to whether or not the PVHI effect is real or simply an issue

[1]School of Geography & Development, University of Arizona, Tucson, AZ, USA. [2]Office of Research & Development, College of Science, Biosphere 2, University of Arizona, Tucson, AZ, USA. [3]Nevada Center of Excellence, Desert Research Institute, Las Vegas, NV, USA. [4]Department of Physics, University of Arizona, Tucson, AZ, USA. [5]Department

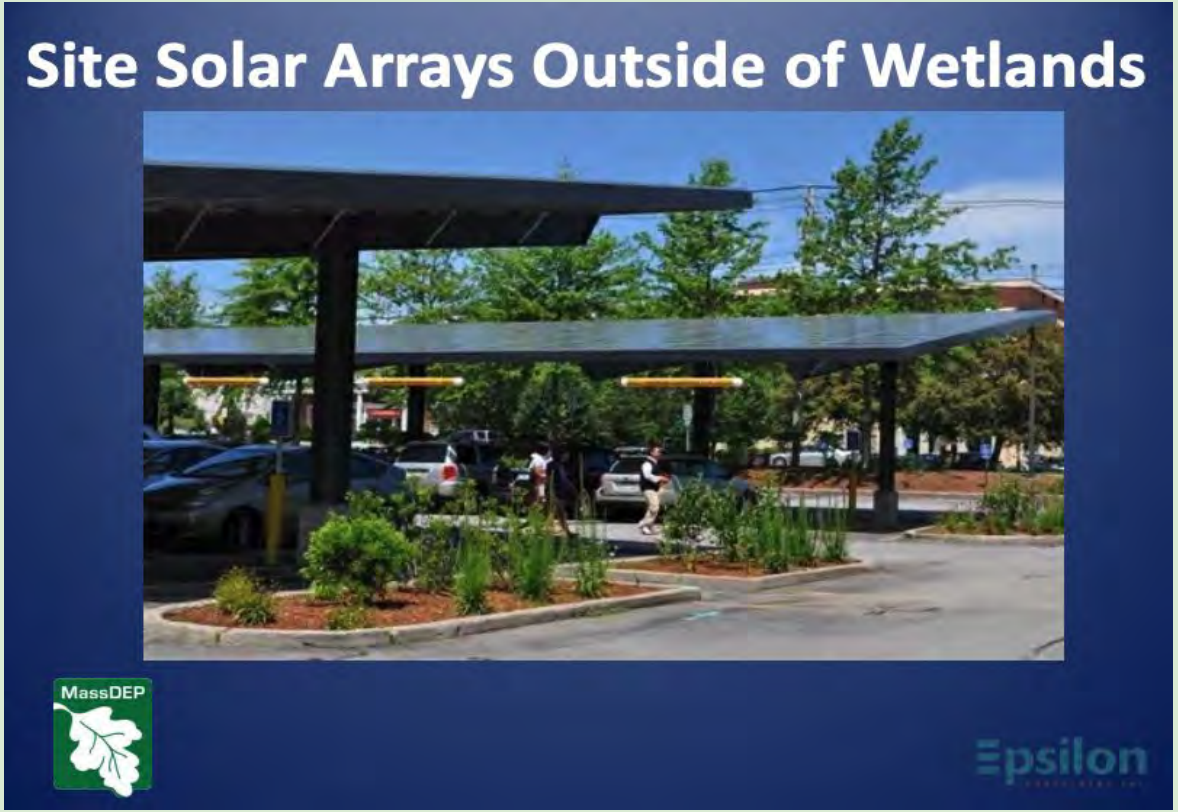
Presentation to Town of Carver, Solar Bylaw Study Committee, Scott Horsley and others Jan. 25, 2023



MassDEP - Epsilon 2015 MACC



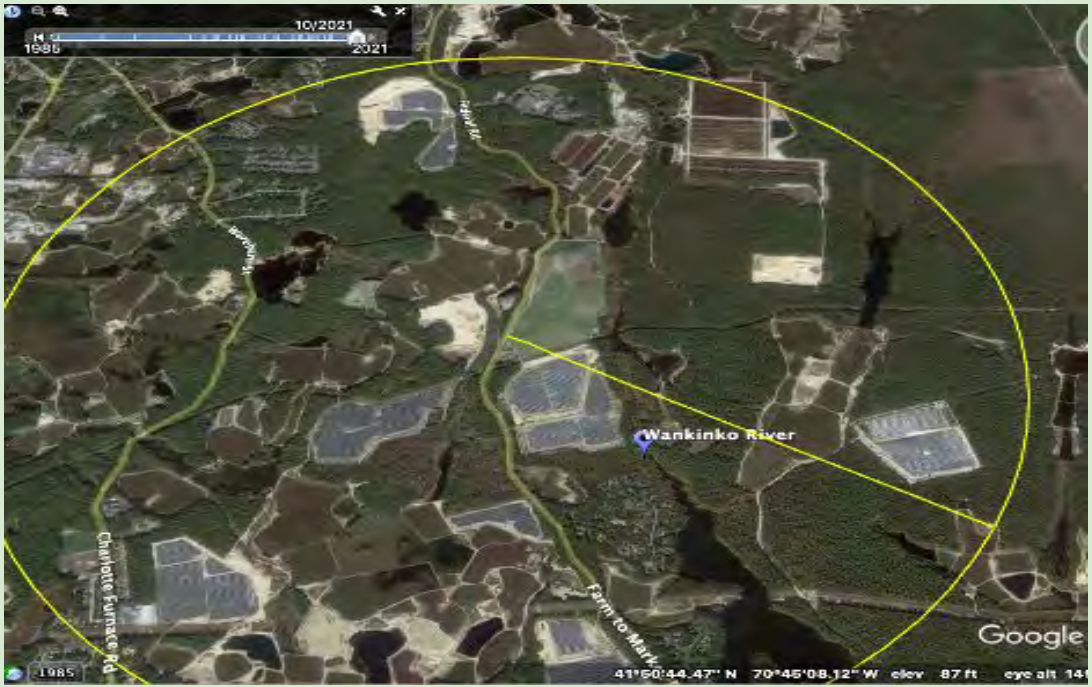
# MassDEP-Epsilon, 2015



But in 2023: since 2011 MassDEP Central

- “at least 260 solar projects in or near wetlands since 2011”
- No known numbers for 3 other regions

Wareham-Carver AD Makepeace Co. (landowner)
Borrego Solar: since 2015 1.5 mile radius



# Carver MA, 2016 before AD Makepeace Co./Borrego Solar

# Carver MA: After 2022 - at least 80 acres

# Clean Water Act & Wetlands Violations

**Mass AG 2021**

- Williamsburg MA: 17 acres over $1 million in penalties
- Southampton MA: $700,000 penalty

**USEPA 2023**

- 4 projects: Alabama, Indiana, Illinois $1.34 million

**“Subsidiaries of large international finance and investment companies”**

# MA Dept. of Energy Resources (DOER)

“SMART” Solar Program 225 CMR 20.00

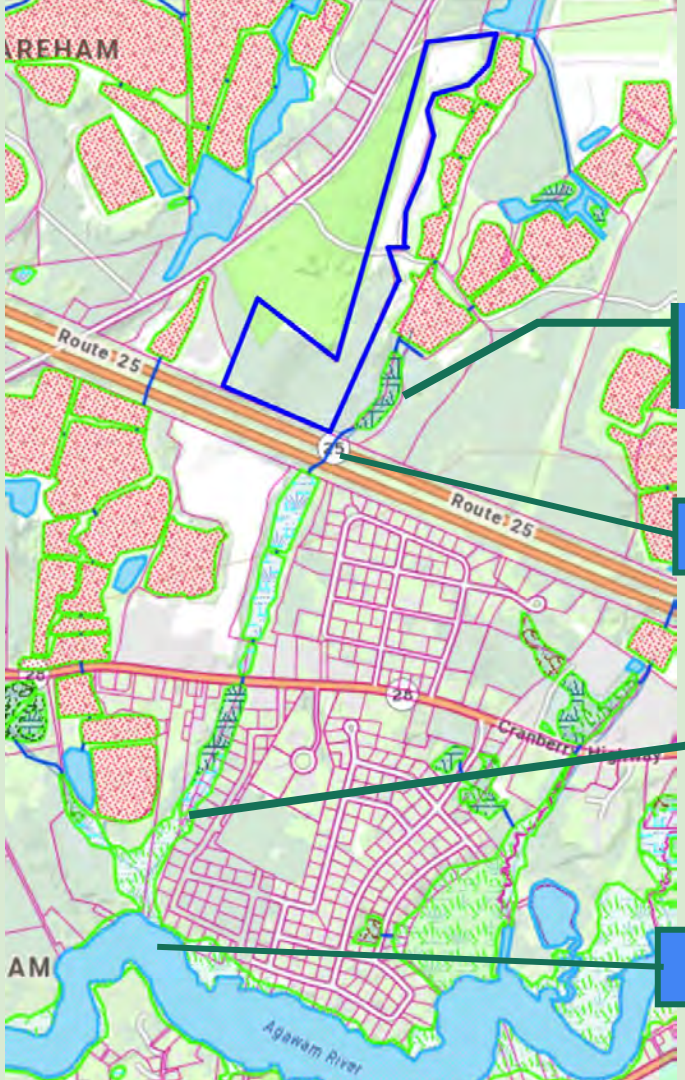
October 8, 2020: SMART Solar “Guideline Regarding Land Use, Siting, and Project Segmentation”

Technical Potential of Solar Siting study underway

MEPA: no programmatic Environmental Impact Report, no MEPA unless an ACEC or other trigger - SMART subsidies are not “Financial Assistance” and DOER “SOQ” is not a permit - MEPA Advisory Opinion, 2022

# Long Road Energy LLC, Wareham MA: site preparation for solar = sand mining near cranberry claiming wetlands exemption, Chapter 61A

# Hydrologic Impact Assessment



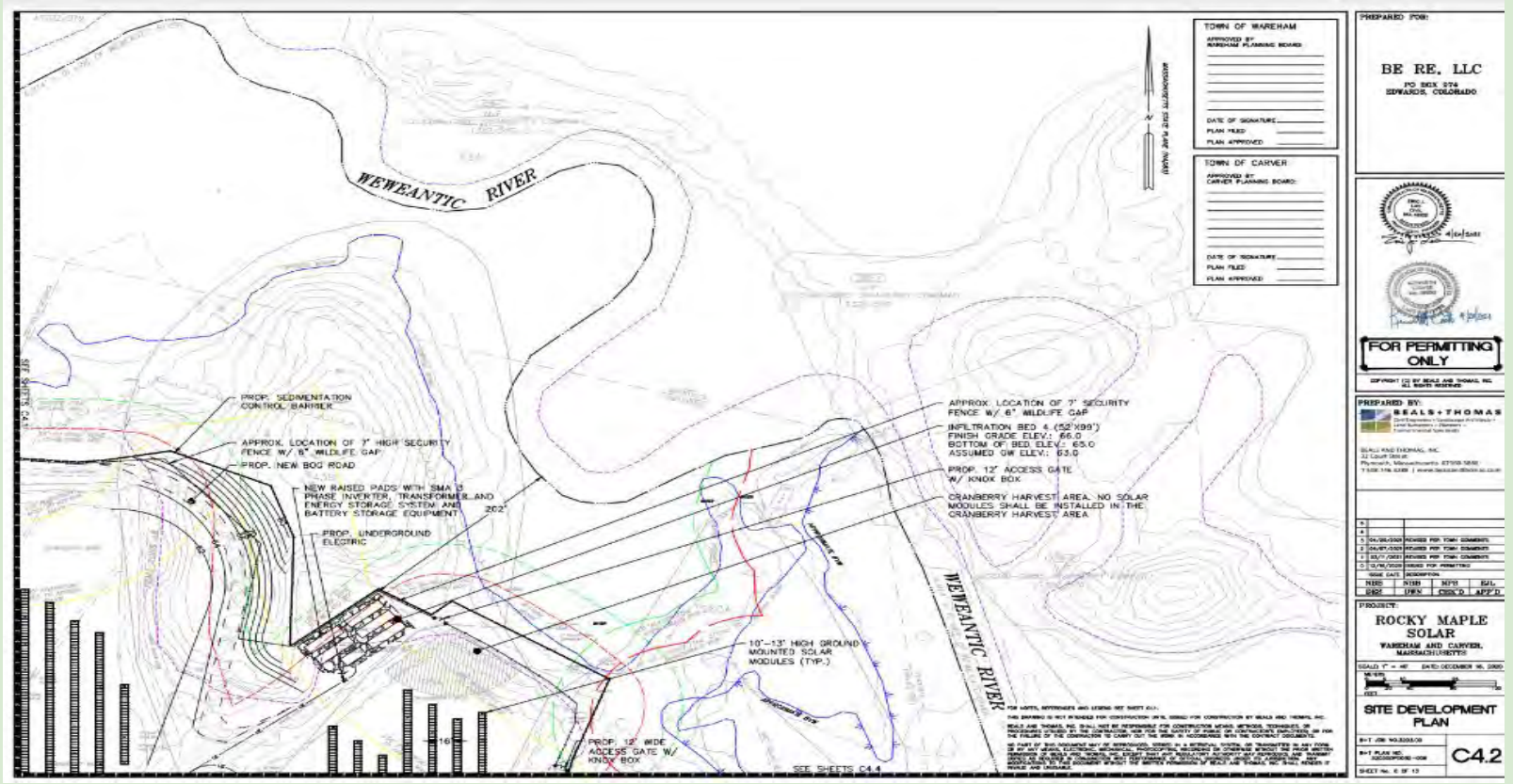

Freshwater Wetlands – water levels, thermal

Stream – flow, nutrients, thermal

Salt Marsh – salinity, nutrients

Estuary – nutrients (cumulative)

# Battery Storage: Rocky Maple Cranberry (landowner)
# BE RE LLC, 31 acres, Carver-Wareham Weweantic River



# Solar & Wetlands: MassDEP Info

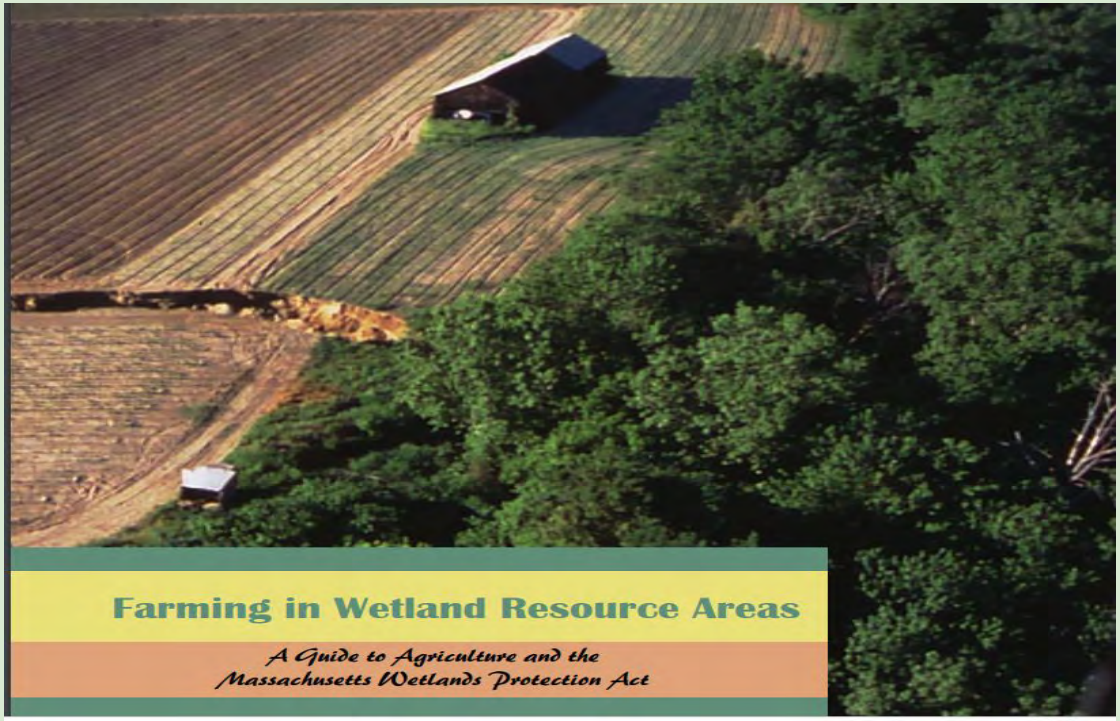
DEP Policy: 17-1

DEP Guidance, 2018: Agriculture, Solar and Wetlands

DEP FAQs on Floating Solar

Farming in Wetland Resource Areas Manual: 1996 Edition

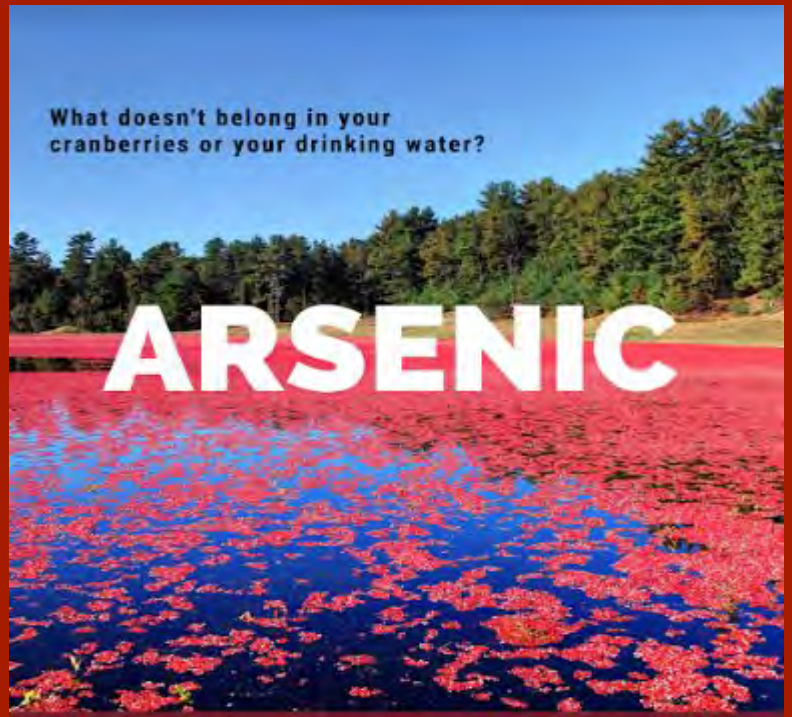
"Normal Improvement of Land in Agricultural Use" is exempt from wetlands laws



# Dual Use-Agrovoltaics: “ASGTU” Cranberry Bogs & Reservoirs: Carver MA

Pine Gate Renewables/Various cranberry bog owners: Carver: $34 million, 3,500 Copper Chromated Arsenic Poles, Chapter 61A land


CCA toxic poles waiting to be installed at PineGate Renewables solar site at 340 Tremont Street, Carver MA, Sept. 2021




Solar projects in Carver are using chromated copper arsenic (CCA) treated poles in solar projects in active cranberry bogs. CCA leaches into the bogs and our drinking water. Act now to stop the contamination.

## PULL THE POLES

FOR MORE INFORMATION: WWW.PULLTHEPOLES.ORG

#PULLTHEPOLES

AD Makepeace-Renewable Energy Development Partners

Swan Holt Bog, Carver MA


Carver MA: One mile of solar canopy over stream; toxic poles installed in riverbank. Location approximate. Project of AD Makepeace Co. and REDP solar. Project underway, Oct. 24, 2021

**This is a significant archeological site.** Makepeace continues to do destructive earth removal here.

# Floating Solar: Franklin Marsh Cranberry (landowner) ReWild Renewables LLC

Franklin Marsh Cranberry, industrial mining operation under ruse of agriculture, creating reservoir

# Zoning Permit/Site Plan Review Application

## 0 CARVER ROAD FLOATING SOLAR

**0 Carver Road**
**Plymouth, Massachusetts**

*Prepared for:*
**ReWild Renewables**
**P.O. Box 1320**
**Portsmouth, NH 03802**

*Prepared by:*

BEALS + THOMAS

Photograph 1: View of existing agricultural reservoir

# Mass. Zoning Act protection for solar

Mass. General Laws, Chapter 40A, Section 3

1985 law to protect on site residential solar from objections of neighbors

Improperly expanded to protect industrial solar from zoning regulations unless municipality can prove it is necessary for the public, health, safety and welfare

Puts inappropriate and undue burden on municipality, reduces home rule and local power

# Mass. Real Estate Tax Statute, G.L. Chapter 61A

2022 amendment via  DRIVE energy act

Allows dual use solar farmland to stay in Chapter 61A for tax purposes

Says dual use solar on farmland protected “agriculture” under Zoning Act

**BUT:** The land must be  “primarily and directly” used for agricultural purposes

Solar generates 10 to 30 x more revenue than hay, cranberries

Solar must not reduce the value of the crop

*Who’s checking?*

Examples of helpful local bylaws and zoning ordinances laws

- Warren MA: Phase 1 Environmental Site Assessment
- Shutesbury MA: 4 to 1 acres mitigation for forest clearcut
- Plymouth MA: 5 acres

Add to Wetlands Order of Conditions:

Decommissioning funds to restore forests, wetlands

Protections from potential battery impacts

Groundwater impacts

Heat Islands

# ACT!

- Get expert help: Make sure your municipality has G.L. Chapter 53G power- use it for the Town hire a lawyer, consultant for the Con Comm
- Think like a lawyer: write a good decision
- DOER solar siting reform
- Wetlands Protection Act exemption: Is it really “normal improvement of land in agricultural use”?
- MEPA environmental impact reports
- MassDEP revise policies, guidelines
- No Chapter 40A, Section 3 zoning protection for large solar

# Resources

Smart Solar Amherst www.smartsolaramherst.org

Smart Solar Shutesbury www.smartsolarshutesbury.org

https://www.youtube.com/watch?v=9DEvEU4BCKU

Emily's Story – Solar Development Disaster in Williamsburg MA

MACC 2023 Documents www.savethepinebarrens.org\

80% of US energy needs can be met by solar on built environment & battery storage

Don't forget conservation and reducing energy use!

www.savethepinebarrens.org