



To preserve, protect and steward our unique and finite land and water resources. They are irreplaceable. We are losing fast. www.pinebarrensalliance.org

March 8, 2021

Town of Wareham
Planning Board
c/o Kenneth Buckland
via Email to kbuckland@wareham.ma.us and Sonia Raposo sraposo@wareham.ma.us

Re: 26-20 Site Plan review of BE RE, LLC, c/o Beals & Thomas, 0 North Carver Road, Wareham, Map 104, Lots 1049 A, 1049 B, 1049 D and 1050

Dear Chairman Barret and members of the Wareham Planning Board,

Thank you for the opportunity to submit comments on the above project. We are an alliance of groups and individuals working to preserve and protect our land and waters in Southeastern Massachusetts.

We support properly sited and permitted solar energy. There should be no land-based solar on undisturbed forested or agricultural lands until all disturbed areas (not including productive agricultural lands such as the Maple Springs bogs) rooftops, canopy areas and paved areas are used for solar.

Unfortunately, Massachusetts's poorly designed solar subsidy programs are destroying land, water, wetlands, biodiversity, wildlife habitat and the globally rare Pine Barrens ecosystems where we live. The lucrative state subsidies driving the rush to build land-based solar are poorly designed and important decisions about solar siting are left to local boards and committees. We support your efforts to implement local bylaws and acknowledge the challenge these large industrial scale projects being promoted by a range of joint venture financiers present to our local communities.

We urge you to exercise the full extent of your regulatory authority to ensure complete and thorough disclosure by BE RE LLC and its consultant Beals+Thomas and to require a thorough analysis of all aspects of this project in order to protect our land, water and community character. We urge you to consider carefully crafted permit conditions tailored to this ecologically significant site that is located on the banks of the Wewantic River, designated by Massachusetts as an Outstanding Water Resource.

According to Mass Audubon:

Careful site selection for renewable facilities of all types is critical to minimizing the loss and fragmentation of wildlife habitat and existing ecosystems that sequester carbon. Beyond their intrinsic value, lands such as forests, farmlands, and wetlands provide essential **ecosystem services**, and they play an important part in building resilience for people and nature.

In recent years, **more than 25% of all new solar arrays** were large-scale ground mounted arrays located on former forests or farmlands. If this trend continues, more than 100,000 acres of land will be converted....There is also a move toward dual solar/agricultural projects, where farming will still occur underneath the arrays – **this is still experimental and needs to be piloted before it is scaled up.** (emphasis added)
<https://www.massaudubon.org/our-conservation-work/advocacy/alternative-energy/solar>

The Massachusetts Department of Energy Resources (DOER) has a poorly designed solar energy financial subsidy program for putting industrial solar on agricultural lands that ignores water quality, biodiversity and wildlife.

DOER's solar financial subsidy program foists upon local governments the obligation to attempt to protect the State's biodiversity from industrial scale energy ground mounted energy projects that have already destroyed over 6,000 acres of forests and/or lands according to MassAudubon's report, *Losing Ground*.

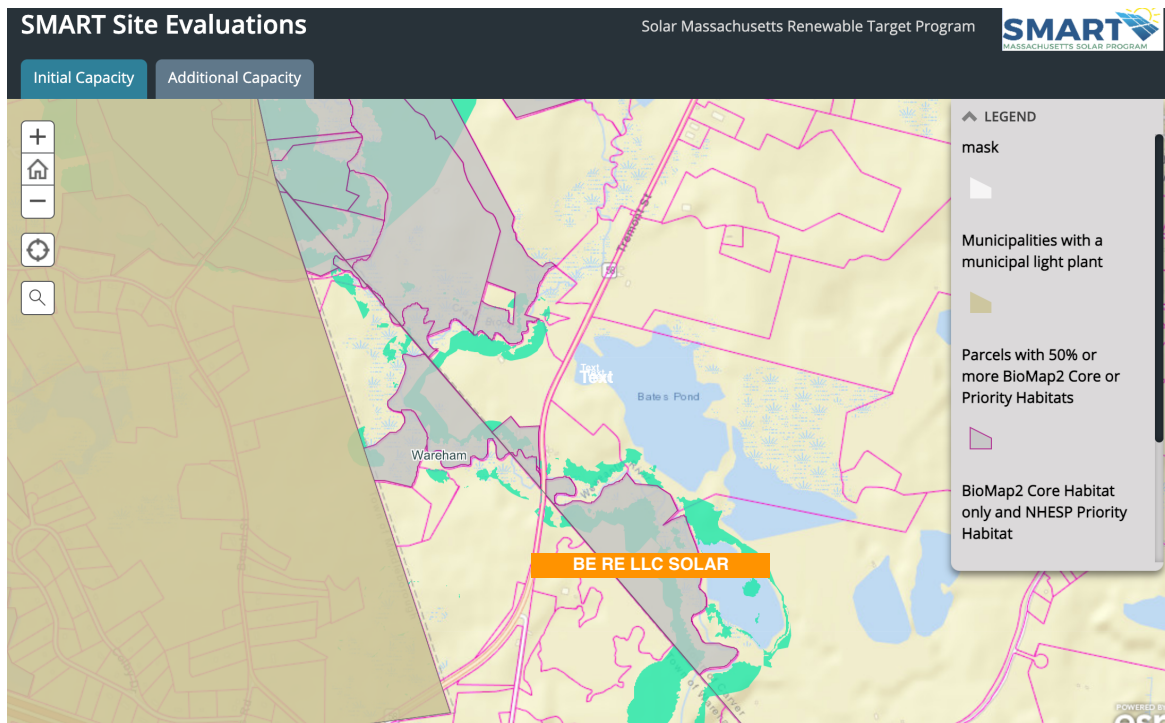
DOER's financial subsidy program fails to require applicants to adequately take into account biodiversity, ecosystems and water quality. BE RE LLC should be required to supply the Planning Board with all ecological studies and surveys conducted for USFWS and NHESP now, not after the fact.

The SMART program regulations prohibit land based solar projects on "Land designated as Priority Habitat and/or Core Habitat" and a parcel "with at least 50 percent of its area designated as Priority Habitat and/or Core Habitat." See, DOER, "Solar Massachusetts Renewable Target Program", 225 CMR 22.00, Guideline Regarding Land Use, Siting and Project Segmentation, effective April 26, 2018. Unfortunately, these regulations exempt a project on agricultural lands from this prohibition. **It appears that if BE RE LLC project was not on agricultural lands it would be prohibited from being built under the SMART program.**

The SMART program fails to take into account that agricultural lands are being converted to industrial uses – land that is zoned residential currently being used for agricultural purposes will now be an industrial energy generating facility.

BE RE LLC should be required to explain this to the Board.

Under the DOER “SMART Site Evaluations” mapping tool the BE RE LLC site is “parcel with 50% or more BioMap2 Core or Priority Habitats” and “BioMap2 Core Habitat only and NHESP Priority Habitat.” This is shown on the DOER SMART mapping tool:

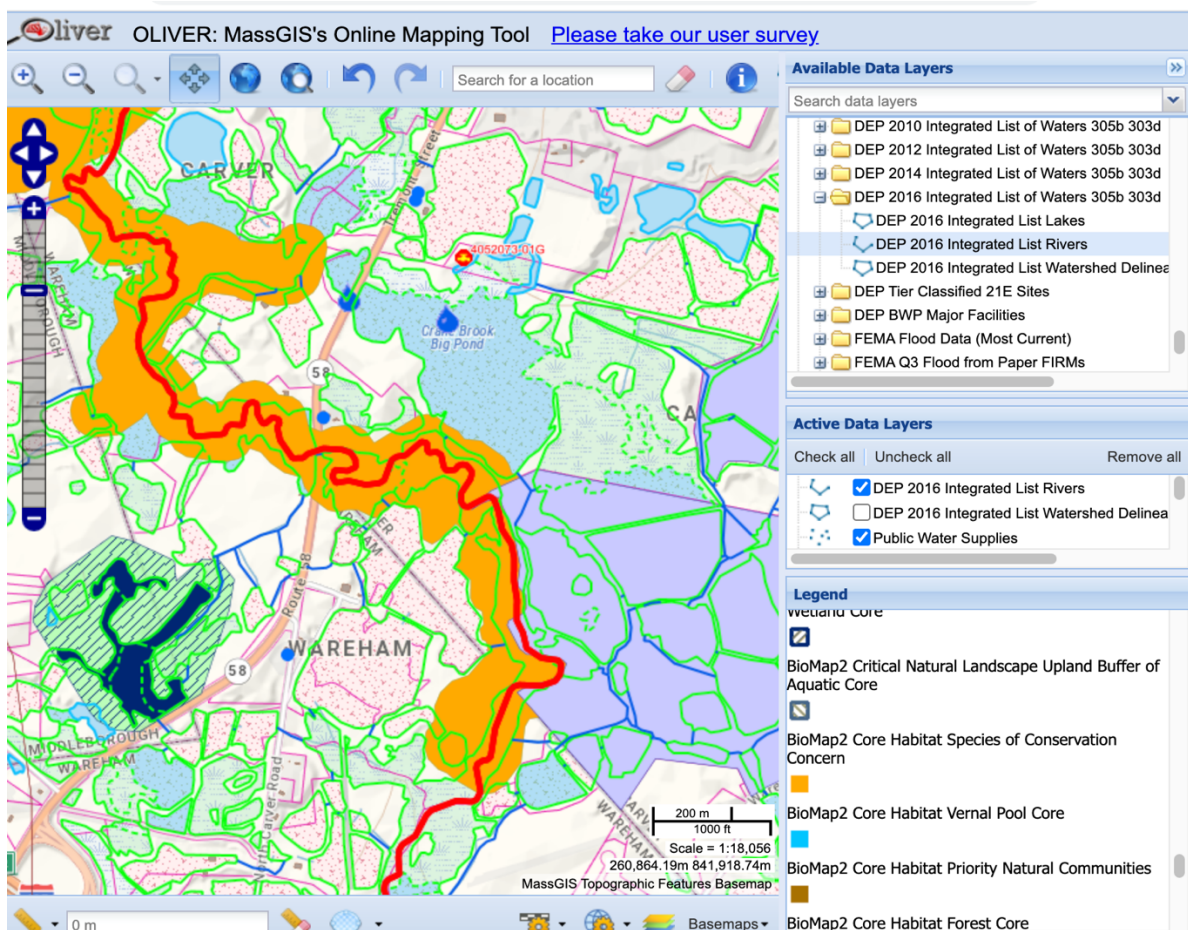


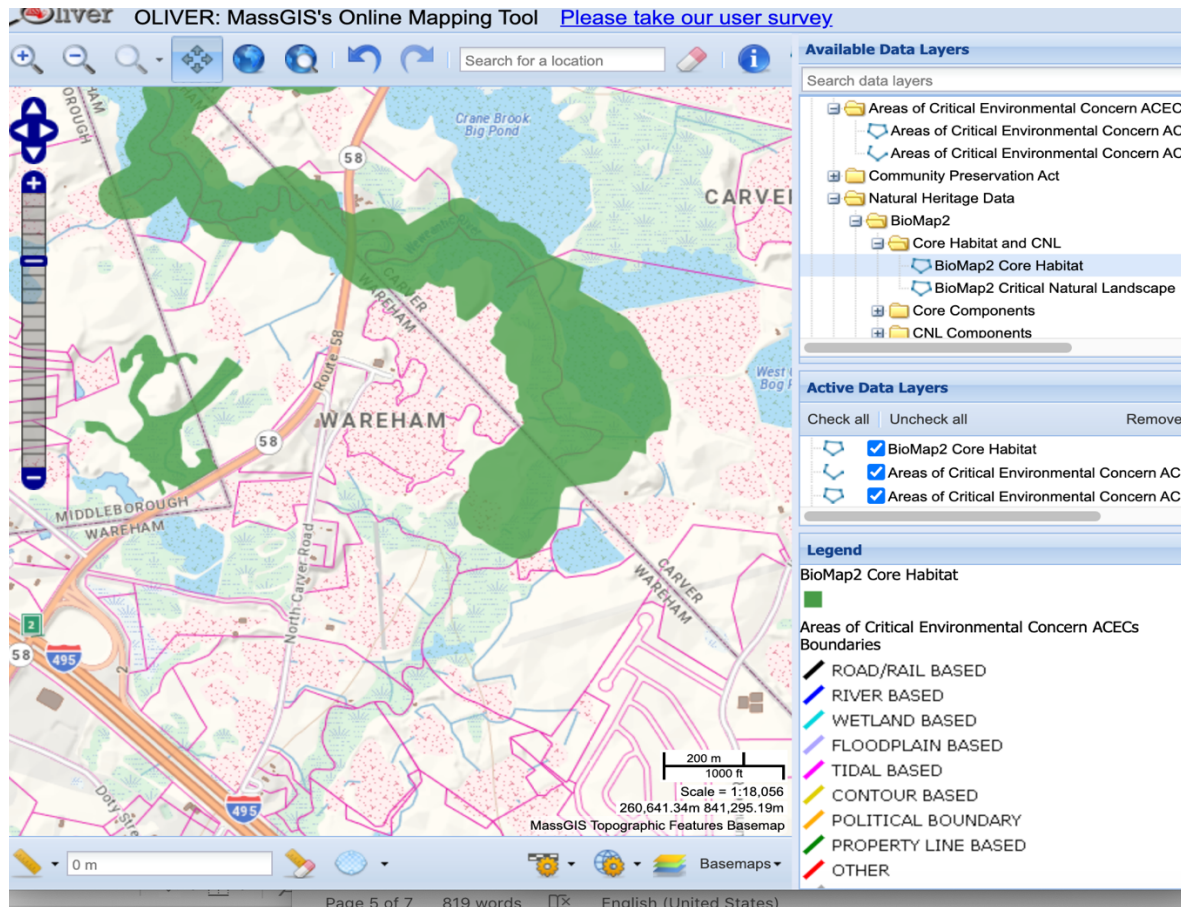
BE RE LLC site has land designated under BioMap2 as Core Habitat Species of Concern and BioMap Core Habitat. See maps from OLIVER GIS, the Massachusetts system, below.

The BE RE LLC application ignores the current environmental status of the site. The application fails to provide maps that show where the solar installation is located in relation to BioMap 2 habitat.

BE RE LLC should be required to produce a map showing the exact location of the solar installation in relation to these BioMap2 areas.

A thorough ecological assessment of the site and the specific location of the solar installation as it relates to BioMap2 habitat should be required.





The BE RE LLC 12/16/2020 application states,

“This project has been designed in compliance with the *Guideline Regarding the Definition of Agricultural Solar Tariff Generation Units (ASTGU)* requirements within the Solar Massachusetts Renewable Target (SMART) program regulations (225 CMR 20.00), which allows for and encourages the dual use of agricultural land, (i.e. maintaining the existing operations while also utilizing the land for solar energy generation). **The proposed work lies within actively farmed land, and other existing disturbed areas, such as the associated agricultural access roads.**”

Cumulative impacts and biodiversity

Have Carver and Wareham required BE RE LLC to study the cumulative impacts of adding another land based solar project that will further fragment wildlife habitat with chain-linked fences, land disturbance and water quality impacts?

In the last several years in Carver and Wareham, destructive AD Makepeace and Borrego Solar projects as well as others have obliterated at least 250 acres of globally rare and diverse Pine Barrens habitat, including NHESP mapped habitat with no Environmental Impact Report for the solar projects.

The BE RE LLC project is being called “green” but will be located on some of the Commonwealth’s most biologically diverse waterways, wetlands and lands. This is at a time when the United Nations Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019) reports that one million species are threatened with extinction and that loss of habitat is worsening the extinction crisis. *IPBES, 2019 Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Inter-governmental Science-Policy Platform on Diversity and Ecosystem Services*. S. Diaz, (eds), IPBES Secretariat, Bonn, Germany.

There has been no study by the Massachusetts Environmental Policy Act (MEPA) unit or DOER of the cumulative impacts of the solar subsidy programs on the groundwater, water bodies, biodiversity, forests and wildlife in this area. This is a fundamental flaw. We call upon MEPA and DOER to undertake this study. In the meantime, there should be a moratorium on all permitting of land based solar projects such as BE RE LLC. The attached article,

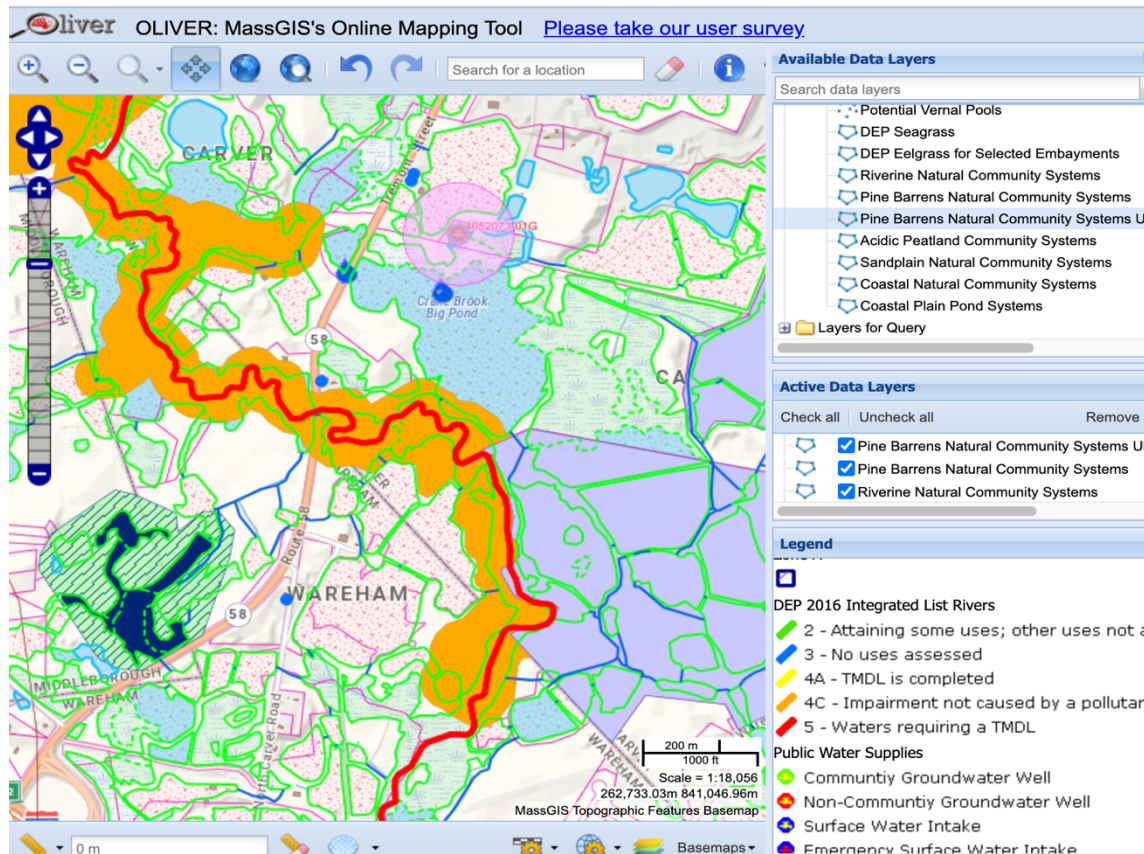
The use of cranberry bogs for industrial solar energy generating stations is at odds with the state programs to restore the natural habitat of these bogs. <https://www.mass.gov/service-details/cranberry-bog-program-learning-agenda> Over the past 10 years, working with local, state, and federal partners (such as the USDA Natural Resource Conservation Service), DER has helped to restore wetlands and streams across hundreds of acres of retired cranberry farmland. Failing to accomplish this restoration can lead to an abundance of problems such as enhanced mosquito breeding sites while diminishing stream and river connectivity, as well as lead to gross pollutions of waterways due to leaching and runoff of agricultural fertilizer and pesticide remnants.

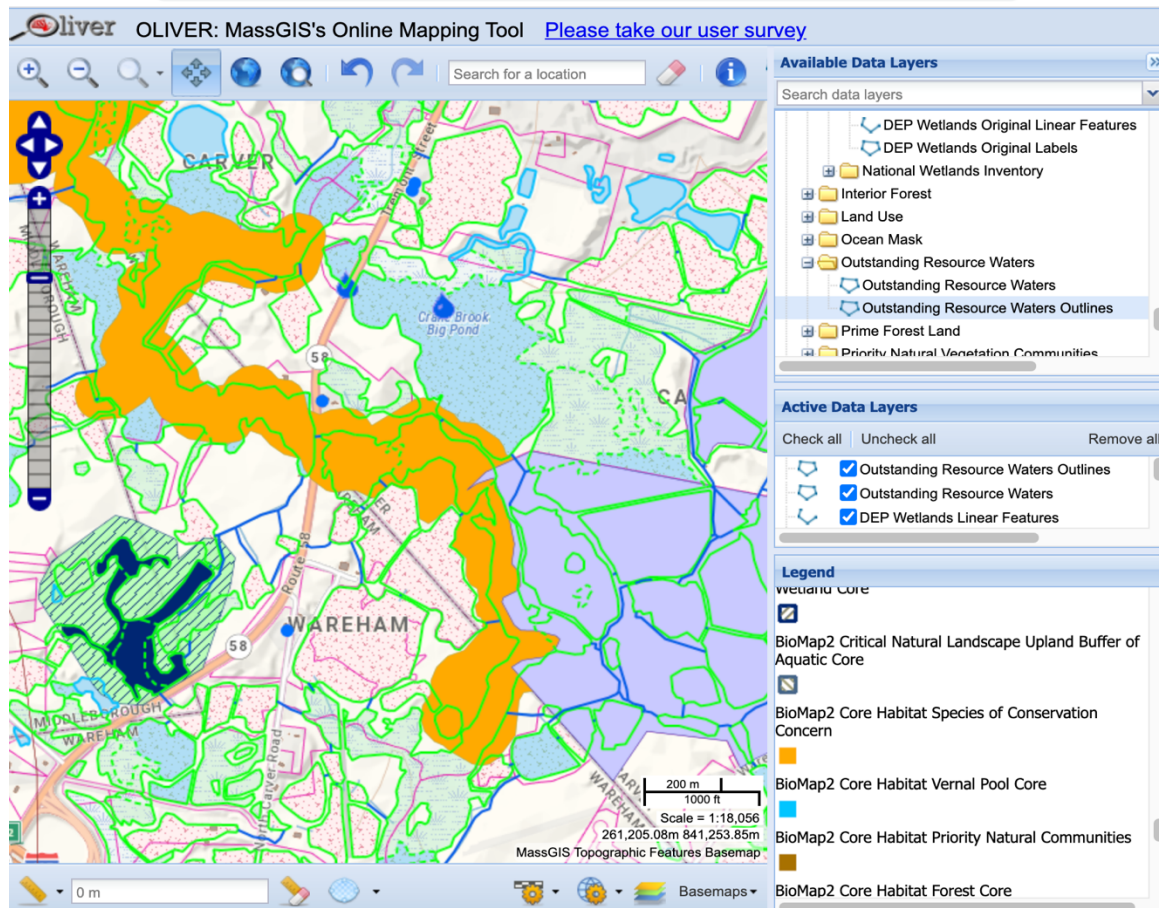
The attached article scientific article, ***Environmental impacts from the installation and operation of large-scale solar power plants*** is one source of information calling for the study of site specific impacts from land based solar installations.

Water pollution issues

The BE RE project is located on the historic, culturally and ecologically significant Weweantic River. *Weweantic* means wandering river in the Wampanoag language. The River historically supported an important herring run. <https://buzzardsbay.org/living-resources/herring-runs/weweantic-herring-historical/>

Massachusetts Department of Environmental Protection “Integrated Waters List” for rivers, which means the water quality of the Weweantic is impaired, or polluted and needs to be cleaned up. Beals+Thomas fails to disclose this in the application and fails to explain how the stormwater system at the site is designed with extra care to prevent further pollution of the Weweantic either through direct discharges or leaching to the aquifer. The application does not show the groundwater flow direction, the depth to groundwater as it relates to the excavation required to install stormwater basins and solar panel mounting equipment and other excavation.





Why did Beals+Thomas fail to disclose the water quality problems of the Weweantic River that abuts the project?

This is information relevant to local permitting and cannot be ignored under site plan review by the Planning Board or by the Conservation Commission.

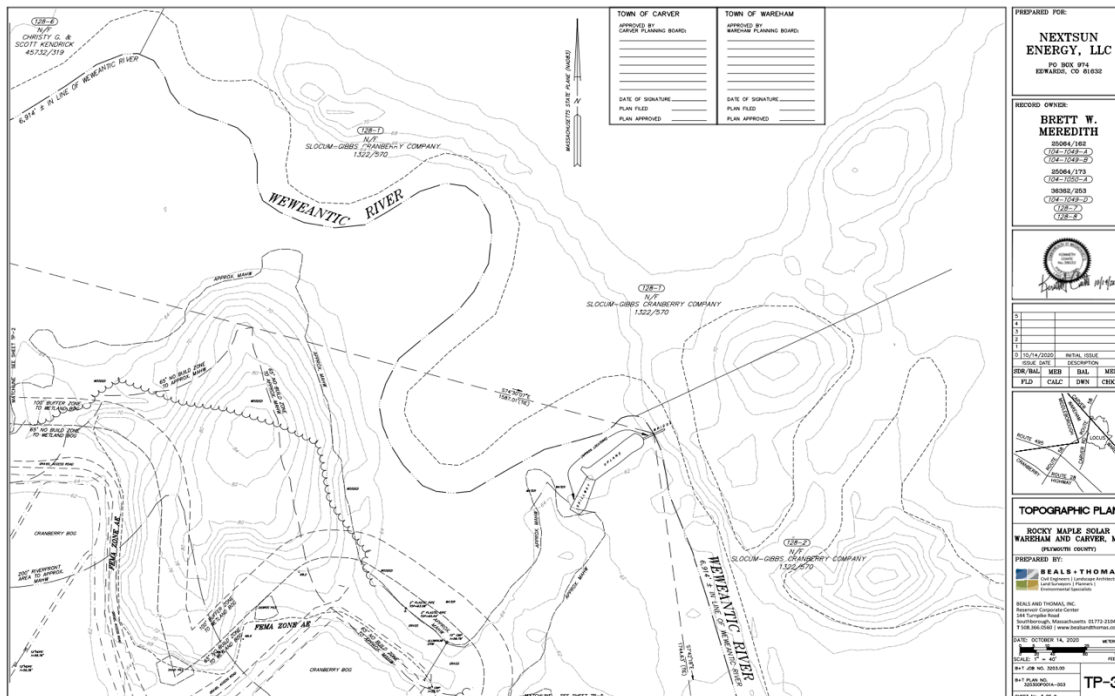
Cranberry bogs are generally located in what were once biodiverse wetlands that have now been converted to monocultures heavily dependent on agricultural chemicals such as fertilizers and pesticides. Their pollution discharges to waterways are exempt from the Clean Water Act, under a poor policy decision by US EPA that allows cranberry bogs to discharge pollution without a permit. *See, Irrigation return flows or discrete discharge? Why water pollution from cranberry bogs should fall within the clean water act NPDES program* Northwestern School of Law journal article, 2007.

Cranberry operations are unique in that they are agricultural operations that require vast quantities of water. Water discharged to lakes, wetlands, and rivers through ditches and canals during the production process can contain the phosphorus fertilizers and

residues of pesticides that were applied during the growing season, which can cause serious water quality problems. Although the cranberry industry has not historically been subject to the Clean Water Act, cranberry bog discharges appear to fit squarely within the purview of the National Pollutant Discharge Elimination System (NPDES) program under that statute. In 2004, the Wisconsin attorney general filed a public nuisance lawsuit against a cranberry grower, alleging that the grower discharged bog water laced with phosphorus to the lake. However, provided that cranberry bog discharges do not fall within the "irrigation return flow" exemption from the Clean Water Act, the NPDES permit program may be a more cost-effective approach to addressing the water quality problems that can be caused by cranberry bog discharges.

There are documented concerns about heavy metal runoff from land-based solar installations. See Attachment A, below. What is the cumulative impact of this runoff from the hundreds of acres of land-based solar that Carver and Wareham have already permitted and that are being installed?

Since the agricultural chemicals running off from the bogs are unregulated (see above), how will the flow rate of runoff change with the placement of solar panels? This should be addressed. **What if the bog stops operating? How does the runoff impact change? Does the pollution to the river increase? If permitted, BE RE LLC be required to capture and treat all agricultural legacy chemicals.**



Attached as a PDF is a peer-reviewed scientific article *Assessing the lifecycle greenhouse gas emissions from solar PV and wind energy: A critical mega-survey* from 2014 that states,

This paper critically screens 153 lifecycle studies covering a broad range of wind and solar photovoltaic (PV) electricity generation technologies to identify 41 of the most relevant, recent, rigorous, original, and complete assessments so that the dynamics of their greenhouse gas (GHG) emissions profiles can be determined. When viewed in a holistic manner, including initial materials extraction, manufacturing, use and disposal/decommissioning, these 41 studies show that both wind and solar systems are directly tied to and responsible for GHG emissions. **They are thus not actually emissions free technologies.** Moreover, by spotlighting the lifecycle stages and physical characteristics of these technologies that are most responsible for emissions, improvements can be made to lower their carbon footprint. As such, through in-depth examination of the results of these studies and the variations therein, this article uncovers best practices in wind and solar design and deployment that can better inform climate change mitigation efforts in the electricity sector.

<https://www.sciencedirect.com/science/article/abs/pii/S0301421513010719?via%3Dihub>

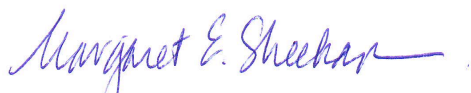
Chapter 61A:

Presumably a Chapter 61A, Section 14 Notice of Conversion is required before this agricultural land can be converted to an **industrial** use. We urge the Town to exercise its right of first refusal to secure the ecological future of this land. It can assign the right to Commonwealth which can work with the landowner to restore the bog under the state Division of Ecological Restoration "Cranberry Program" since the owner is concerned about the future financial viability of its cranberry operation, as stated at the last Planning Board hearing.

In summary, we do not oppose all solar energy. However, we demand complete transparency and accountability by Beals+Thomas and BE RE LLC with regard to the environmental, health, safety and economic aspects of this project. The long term impacts of this project on our community and the environment requires this transparency and accountability and the public is entitled to expect that the Planning Board ensure that a full evaluation of all the impacts are disclosed.

Thank you for your consideration.

Very truly yours,



Meg Sheehan
Volunteer
Community Land & Water Coalition
environmentwatchesoutheasternma@gmail.com
508-259-9154

Cc:
Senator Marc Pacheco
Executive Office of Energy and Environmental Affairs
Department of Energy Resources
Department of Ecological Restoration
MEPA Unit
Town of Carver: Select Board, Conservation Commission, Planning Board
Town of Wareham: Conservation Commission
Mass Audubon, Heidi Ricci
US EPA – Stormwater Program
MassDEP – Stormwater Program

ATTACHMENT A

Information on water pollution concerns with industrial land based solar:

From Concerned Citizens of Fawn Lake, Virginia:

<https://sites.google.com/view/concernedcitizensspotsylvania/toxic-materials?authuser=0>

The fact that cadmium can be washed out of solar modules by rainwater is increasingly a concern for local environmentalists like the Concerned Citizens of Fawn Lake in Virginia, where a [6,350 acre solar farm](#) to partly power [Microsoft data centers](#) is being proposed.

“We estimate there are 100,000 pounds of cadmium contained in the 1.8 million panels,” Sean Fogarty of the group told me. “Leaching from broken panels damaged during natural events — hail storms, tornadoes, hurricanes, earthquakes, etc. — and at decommissioning is a big concern.”

There is real-world precedent for this concern. A tornado in 2015 broke 200,000 solar modules at southern California solar farm Desert Sunlight.

"Any modules that were broken into small bits of glass had to be swept from the ground," Mulvaney explained, "so lots of rocks and dirt got mixed in that would not work in recycling plants that are designed to take modules. These were the cadmium-based modules that failed [hazardous] waste tests, so were treated at a [hazardous] waste facility. But about 70 percent of the modules were actually sent to recycling, and the recycled metals are in new panels today."

And when Hurricane Maria hit Puerto Rico last September, the nation's second largest solar farm, responsible for 40 percent of the island's solar energy, [lost a majority of its panels](#).

Scientific studies show very high quantities of Cadmium can leach out in a few months in acidic conditions. Our soil and Virginia clay are acidic, so rapid and thorough cleanup of any damaged Cadmium-containing panels is critical.

sPower recently stated that they will use some MonoPERC panels, which are crystalline silicon and do not contain any Cadmium. The MonoPERC panels are 10-20% more efficient than the CdTe panels, so they will require less land (hundreds of acres less). However, they are more expensive. It should be noted that the risks associated with Cadmium would be eliminated -- if sPower used more environmentally friendly panels.

Toxic chemicals such as herbicides and pesticides should be carefully controlled and only applied by certified professionals.

Cleaning agents may also be toxic to the environment. sPower indicates that cleaning agents will not be used, as such would void their warranties on solar panels.

<https://www.chijournal.org/C428>

Stormwater Flows

Two Dimensional Modeling to Simulate Stormwater Flows at Photovoltaic Solar Energy Sites, <https://pubs.rsc.org/en/content/articlelanding/2016/ee/c6ee00578k#!divAbstract>

The emission of silver and zinc to the aqueous environment (rain, fog, dew) from polymer solar cells installed outdoors is presented. Studies included pristine solar cells and solar cells subjected to mechanical damage under natural weather conditions in Denmark. We find the emission of silver and zinc to the environment through precipitated water for damaged solar cells, and also observed failure and emission from an initially undamaged device in an experiment that endured for 6 months. In the case of the damaged cells, we found that the drinking water limits for Ag were only exceeded on a few single days. We also progressed our studies to include end-of-life management.

To assess the implications of improper practices (uncontrolled disposal, landfilling) at the end-of-life, we buried different OPV types in intact and damaged forms in soil columns. In the case of high Ag emission (shredded cells), the potential for migration was confirmed, even though the soil was found to exhibit sequestration of silver. We conclude that recycling of Ag at the end-of-life is mandatory from an environmental point of view.

Cadmium risk in solar panels: <https://www.cleanenergyauthority.com/solar-energy-news/cadmium-risk-in-photovoltaic-panels-041411>