



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

### VIA ELECTRONIC MAIL

April 18, 2018

Emilee Mooney Scott, Esq.  
Earl W. Phillips, Jr., Esq.  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103

RE: **PETITION NO. 1341** – The Durham Manufacturing Company petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 1.215-megawatt AC solar photovoltaic electric generating facility located at the Durham Manufacturing Company, 201 Main Street, Durham, Connecticut.

Dear Attorneys Scott & Phillips:

The Connecticut Siting Council (Council) requests your responses to the enclosed questions no later than May 2, 2018. To help expedite the Council's review, please file individual responses as soon as they are available.

Please forward an original and 15 copies to this office, as well as a copy via electronic mail. In accordance with the State Solid Waste Management Plan, the Council is requesting that all filings be submitted on recyclable paper, primarily regular weight white office paper. Please avoid using heavy stock paper, colored paper, and metal or plastic binders and separators. Fewer copies of bulk material may be provided as appropriate.

Any request for an extension of time to submit responses to interrogatories shall be submitted to the Council in writing pursuant to §16-50j-22a of the Regulations of Connecticut State Agencies.

Sincerely,

Melanie A. Bachman  
Executive Director

MB/RM/lm

c: Council Members



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### Petition No. 1341

#### Interrogatories

April 18, 2018

#### General

1. Regarding Petition Tab 7, was a copy of the petition served on the Town of Durham Inland Wetlands Commission?
2. What is the relationship between the petitioner and the developer? If the project is approved, identify all permits necessary for construction and operation and which entity will hold the permit(s)?
3. Is the Petitioner participating in any Department of Energy and Environmental Protection renewable energy programs? If so, identify the programs.

#### Proposed Site

4. What types of development are allowed in the Farm Residential zone district? What would be the minimum lot size of development under the applicable zone?
5. Have any land use development plans been approved by the municipality for the proposed site in the past?
6. Is the site parcel, or any portion thereof, part of the Public Act 490 Program? If so, how does the municipal land use code classify the parcel(s)? For example, is/are the parcel(s) classified as "Tillable D – good to fair"? How would the project affect the use classification?
7. Has the State of Connecticut Department of Agriculture purchased any development rights for the project site or any portion of the project site as part of the State Program for the Preservation of Agricultural Land?
8. Referring to Petition p. 11, has the Petitioner received a response from the State Historic Preservation Office regarding the proposed project? If so, please provide?
9. Is the Christmas tree farm still active? If so, is it used by the property owner or is it leased to a third party?
10. Where is the nearest off-site residence from the solar field perimeter fence? Provide the distance, direction and address to the off-site residence.

#### Energy Production/Interconnection

11. Have electrical loss assumptions been factored into the rated output of the facility? Provide the output of the facility in megawatts AC at the point of interconnection.
12. What is the DC/AC ratio of the proposed project? What project design considerations were used to minimize losses associated with DC/AC ratio?

13. Referring to Petition p. 30, explain why a solar panel orientation with a 30 degree tilt was selected for this facility. Is the project designed to maximize annual energy production?
14. What is the projected capacity factor (expressed as a percentage) for the proposed project?
15. What is the efficiency of the photovoltaic modules?
16. Would the power output of the solar panels decline as the panels age? If so, estimate the percent per year.
17. What is the operational life of the facility?
18. Is a System Impact Study with the local electric distribution utility required for the interconnection? Does the Petitioner have an Interconnection Agreement and with whom?
19. Would the impact of soft shading, such as air pollution or hard shading, such as bird droppings or weather events, such as snow or ice accumulation, hail, dust, pollen, etc. reduce the energy production of the proposed project? If so, was this included in the proposed projects capacity factor and/or loss assumptions? Would any of these expose the solar panels to damage?

#### **Site Components and Solar Equipment**

20. Provide the specification sheets for the proposed inverters and solar photovoltaic panels. How are the inverters being installed at the site (i.e. concrete pads?).
21. Referring to Petition Site Plan SP-2, provide specifications/design for the electrical equipment.
22. Referring to Petition p. 5, is it feasible to use several large inverters instead of 25 inverters? Describe the mounting equipment/method for the 25 inverters (e.g. concrete pads, posts)
23. Referring to Petition p. 5, explain the interconnection "front service" and "rear service" terminology.
24. Referring to Site Plan DN-1, what is the anticipated length of the racking posts and to what depth would the posts be driven into the ground?
25. What is the design wind speed of the solar panel mounts? How are the panels adhered to the mount? What prevents the solar panels from separating from either the racking or the foundation during high winds?
26. Has any analysis been conducted to determine structural limits of snow accumulation on the solar panels and steel support structures, assuming heavy, wet snow and or ice?
27. Referring to Petition Environmental Report p. 16, p. 29, and Site Plan DN-1, please clarify the following
  - a) What is the overall height of the solar panels - 9.5 feet or 8.0 feet above grade?
  - b) What is the total number of solar panels to be installed at the site?
  - c) Would differing figures alter the photo-simulation provided on p. 30? If so, please modify accordingly.

28. Site Plan DN-1 shows 13-foot spacing between the panel rows. Can this project footprint be minimized by decreasing spacing between the panel rows and/or by modifying the solar panel tilt angle?
29. Can the footprint of the facility be reduced by using a higher wattage solar panel?
30. What is the color of the solar panels? Are other colors available? Is the glass casing reflective? Are there solar panels available with non-reflective glass? If so, what are the costs and benefits of each type?

#### **Public Safety**

31. Referring to the Connecticut Airport Authority's correspondence dated April 2, 2018, please provide the following:

- a) What is the distance/direction to the Maplewood Farm Airport?
- b) Would glare from the solar arrays have any impact on air navigation?
- c) Has a glare analysis been conducted? If not, under what circumstances would a glare analysis be required by the Federal Aviation Administration?
- d) Has the petitioner filed a Notice of Proposed Construction or Alteration (FAA Form 7460-1) directly to the Federal Aviation Administration for this site?

32. With regard to emergency response:

- a. Is outreach and/or training necessary for local emergency responders in the event of a fire or other emergency at the site?
- b. How would site access be ensured for emergency responders?
- c. In the event of a brush or electrical fire, how would the Petitioner mitigate potential electric hazards that could be encountered by emergency response personnel?
- d. Could the entire facility be shut down and de-energized in the event of a fire? If so, how and by whom?

#### **Environmental**

33. Referring to Petition p. 9, what Department of Energy and Environmental Protection permit would require further review of potential impacts to the slimy sculpin? Has additional review with DEEP occurred? Are there DEEP records of the slimy sculpin within Ball Brook?
34. Did the Petitioner examine the possibility of installing an overhead utility line from the solar field to the DMC building to avoid direct impacts to Ball Brook?
35. Describe the length and construction method of the coffer dams proposed in Ball Brook.
36. Referring to the Environmental Assessment p. 5, was any further analysis done to determine if a vernal pool exists in Wetland 3? Referring to Site Plan EC-1 describe the vegetation that will be cleared along the west side of Wetland 3.
37. Is the project located within a DEEP-designated aquifer protection area?
38. Are residential areas abutting the site served by private wells? Assuming some abutting areas are served by private wells, can vibrations caused by the installation of the racking posts cause sediment buildup in the wells? What measures will the petitioner undertake to ensure there is no disruption to well water flow or water quality?

39. Are the racking posts galvanized steel? If so, if the posts extend into the water table, would there be oxidation and the release of potentially hazardous substances into groundwater such as zinc?
40. Is any portion of the facility within the limits of the Durham Meadows Superfund Site? If so, are any special procedures required for any project dewatering or excavation activities?
41. Would glare from the solar panels attract birds (ex. appear as water) and create a collision hazard?
42. Referring to Site Plan DN-1, what is the distance between the bottom fence edge and ground level? Could the fence be designed so that bottom edge of the fence allows for small animal movement?

#### **Construction Questions**

43. Referring to Petition Environmental Assessment p. 1, site disturbance in the solar field area will total 6.4 acres. Is initial site disturbance (tree clearing, grubbing, grading, excavation, filling and dewatering) occurring in phases less than five acres? Could construction be phased to achieve site stabilization in increments less than five acres? (Note: Connecticut Department of Energy and Environmental Protection “DEEP” General Permit for the Discharge of Stormwater and Dewatering Wastewasters Associated with Construction Activities states that, “Whenever possible, the site shall be phased to avoid the disturbance of over five acres at a time...”)
44. Can the project be constructed in accordance with the attached guidance from Department of Energy and Environmental Protection entitled, “Stormwater Management at Solar Farm Construction Projects, dated September 8, 2017”?
45. Would a General Permit from the Department of Energy and Environmental Protection, or other type of permit, be required? If so, when would the permit filings occur?
46. The Petition Environmental Assessment states site soils are in Hydrologic Soil Group C. What special erosion and sedimentation controls are required for these types of soils to ensure non-migration of soil fines out of the project area? How will the site and stream trench area be stabilized post-construction to ensure soil fines are not running off within stormwater?
47. In regards to the temporary soil stockpile on the west side of Ball Brook, can another location be used or additional protective measures deployed to ensure stockpiled materials do not impact the brook?
48. The Petition site plans do not show any topographic information. What will be the final grade and slope of the solar field area?
49. Estimate the amounts of cut and fill in cubic yards for site construction.
50. How would racking posts be driven into the ground? In the event that bedrock is encountered, what methods would be utilized for installation?
51. Referring to Sheet SP-1, a note specifies a planting area along the north side and northwest side of the project site. Besides relocated evergreen trees, what other types of vegetation would be installed? Would existing, mature vegetation remain between Maiden Lane and the north perimeter fence?

### **Maintenance Questions**

52. Would snow accumulation on the solar panels affect the output of the facility? Under what circumstances would snow be removed? Describe snow removal methods and site access.
53. Would the installed solar panels require regular cleaning or other, similar, maintenance? How would this be accomplished and at what intervals? Would any chemicals be used or only water? Would this maintenance activity have any impacts to water quality?
54. What is the post-construction vegetative cover for the solar array area and area outside of the perimeter fence? Describe the type and frequency of vegetation management for the site, including areas inside and outside of the perimeter fence.



## **Stormwater Management at Solar Farm Construction Projects**

### **September 8, 2017**

Solar farms are on-the-ground installations of arrays of photovoltaic cell panels, supporting structures and related equipment for the production of electricity. As with other types of construction projects, the construction of solar farms can involve land clearing, grading, excavation, trenching, dewatering and similar activities that create land disturbances which potentially result in soil erosion and sediment discharges polluting wetlands, streams and other surface waters. Construction-related land disturbances of 0.5 acres or larger are regulated in Connecticut pursuant to the Connecticut Soil Erosion and Sediment Control Act under Sections 22a-325 to 22a-329, inclusive, of the Connecticut General Statutes ("CGS"). Construction-related land disturbances of one (1) acre or larger are also regulated under CGS Section 22a-430 and under Section 402(p) of the federal Clean Water Act and the National Pollutant Discharge Elimination System ("NPDES") program. Prior to the start of such regulated activities, authorization is required from local authorities and, for larger projects, the Connecticut Department of Energy and Environmental Protection ("Department"). Construction projects involving five (5) or more acres of land disturbance require an individual NPDES discharge permit from the Department, or may be eligible to register for coverage under the Department's NPDES General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (general permit).

The Department has encountered repeated problems associated with solar farm construction projects covered under the general permit, from the registration process through construction activities. Although in no way an exhaustive list, the following are common problems associated with solar farm general permit registration applications and ways to address such problems:

- Applicants have been submitting registration applications that lack the requisite information or the requirements necessary for authorization under the general permit. The Department requires a complete and sufficient application when a registration application is filed, and may reject any registration application it deems to be incomplete or insufficient.
- Applicants are not adhering to the sixty (60) day/ninety (90) day time frame for Department review as required by Section 3(c) of the general permit. While the Department has on occasion shortened the review timeframe, Applicants are expected to allocate no less than the requisite time frame for the registration application review process and must plan accordingly.
- Registration applications for solar farm projects often fail to identify the project's contractor and sub-contractors. Section 5(b)(1)(viii) of the general permit mandates that this information be included in the registration application.

- Applicants have been repackaging the Siting Council submittal, which is not acceptable. Section 3(c)(2)(D) of the general permit mandates that the application submittal include only materials required to support the Stormwater Pollution Control Plan (“SWPCP”). This information must be up-to-date and accurate. Any superfluous information delays the registration application review process.
- SWPCPs for solar farm projects are often lacking sufficient detail and information. An approvable SWPCP shall include, but not be limited to, the location of all erosion, sediment and stormwater control measures including detailed design cut sheets with supporting calculations, construction means and methods, project phasing (i.e., site planning, pre-construction, construction, and post-construction stabilization, etc.), construction sequencing and a construction schedule.
- The Applicant’s design professional must be well-versed in the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (“E&S Guidelines”), specifically the techniques found in Chapter 4, Large Construction Sites, the 2004 Connecticut Stormwater Quality Manual, as well as *current* best management practices (BMPs) recognized by the International Erosion Control Association (IECA), provided such BMPs are equal to or better than the E&S Guidelines.
- From the Department’s perspective, an approvable SWPCP will include methods for avoiding compaction of soils, disconnection and reduction of runoff associated with solar panel arrays, avoidance of concentration of stormwater, and other measures necessary to maintain or improve pre-construction hydrologic conditions.
- Applicants need to follow the SWPCP review checklist when preparing the SWPCP, giving specific attention to post-construction stormwater controls and the development of a detailed long-term maintenance plan to ensure that the SWPCP meets the terms and conditions of the general permit.

Subsequent to authorization for coverage under the general permit, the Registrant is responsible for ensuring compliance with all terms and conditions of the general permit and the approved SWPCP once construction has been initiated. However, for solar farm projects, Registrants often fail to comply with the terms and conditions of the general permit, including the approved SWPCP. In particular, Department staff have observed the following issues that a routine inspection protocol and proper oversight, as required under the general permit, would have prevented, including but not limited to:

- pre-construction site planning and management deficiencies (e.g., existing vegetation, scheduling, training, phasing/sequencing, tree protection, etc.)
- ineffective placement, maintenance, and/or repair of administrative/procedural, vegetative, and structural BMPs (e.g., erosion, sediment and stormwater runoff controls, good housekeeping, materials management, and training)
- lack of thorough inspections
- ineffective or untimely corrective action
- ineffective stabilization practices
- ineffective permanent post-construction controls (i.e., store, treat and direct stormwater quality and quantity to pre-construction levels)

Such issues at solar farm construction projects raise concerns, since such projects often create areas of land disruption larger than the generally accepted BMPs of five (5) acres anticipated under the general permit. As a result, any applicant seeking coverage under the general permit

for a solar farm construction project should take care to address the issues noted above. While by no means exclusive, some recommendations that should be incorporated into a SWPCP to address these issues include:

- Ensuring that only a Professional Engineer and/or Landscape Architect, as defined in Section 2 of the general permit, who meets the qualifications described in Section 5(b)(4)(A)(ii) and who has been approved in writing by the Commissioner, serve as the Commissioner's agent to inspect the site and also serve as the qualified inspector for the purposes of Section 5(b)(4) of the general permit ("authorized professional"). Such authorized professional must remain in good standing with the Connecticut Department of Consumer Protection and be technically and ethically qualified to inspect the site and be retained for the duration of the construction project until the Notice of Termination acceptable to the Commissioner has been filed as described below.
- Ensuring that the authorized professional prepare a proposed inspection checklist to assure the construction project is being conducted in compliance with the terms and conditions of the general permit, and the approved SWPCP is implemented in accordance with the general permit. The inspection checklist shall comply with Section 5(b)(4)(B)(iii) of the general permit, and include a space for the authorized professional's signature and professional stamp.
- Ensuring that the credentials for the authorized professional proposed by the Applicant and the proposed inspection checklist prepared by such authorized professional be submitted for the review and approval of the Commissioner and be included with the registration application for the general permit. No other professional may serve as the authorized professional without the prior submittal of relevant credentials and inspection checklist for the Commissioner's review and written approval.
- Ensuring that the authorized professional personally perform all pre-construction, construction, and post-construction site inspections; perform inspections at the end of any storm event whether or not such storm generates a discharge; and prepare and submit all inspection reports including the supporting inspection checklists in compliance with Sections 5(b)(4)(A) and 5(b)(4)(B) of the general permit.
- Ensuring that the authorized professional report any violations of the terms and conditions of the general permit or the SWPCP to the Commissioner's designee within two (2) hours of becoming aware of such violation, or at the start of the next business day of becoming aware of such violation outside normal business hours and shall, within five (5) days, prepare and submit a signed and stamped written report, which documents the cause of the violation, duration including dates and times, and corrective action taken or planned to prevent future occurrences.
- Ensuring that if circumstances necessitate a revision to the SWPCP, the authorized professional works with the Permittee's design professional to ensure compliance with the terms and conditions of the general permit, and any such change to the SWPCP shall be submitted for the review and written approval of the Commissioner.
- Ensure that the authorized professional reviews all stormwater monitoring reports to evaluate the effectiveness of the SWPCP and to document any adverse impacts that any stormwater controls on the construction site or discharges from the construction site may have on wetlands, streams, any other receiving waterbodies. Such evaluation shall be documented in the inspection reports and inspection checklists performed pursuant to Section 5(b)(4) of the general permit.

- Ensuring that, in the event the authorized professional identifies a violation of the terms and conditions of the general permit, the SWPCP, or otherwise identifies adverse impacts on wetlands, streams or any other receiving waterbodies, that construction activity shall immediately cease and the site stabilized until such violation or adverse impacts have been corrected.
- Ensuring that reporting and record-keeping of all inspection checklists and inspection reports comply with the requirements of Section 5(d) of the general permit, except that a copy shall also be submitted electronically to the Department within ten (10) days from the date such inspection was performed.
- Ensuring that all inspection checklists and inspection reports comply with the requirements for Certification of Documents in Section 5(i) of the general permit, including the requirement that such checklists and reports shall also be prepared, stamped and signed by the authorized professional.
- After completion of a construction project, ensuring that a Notice of Termination is filed in compliance with Section 6 of the general permit, including the requirement that such Notice of Termination be stamped and signed by the authorized professional certifying that such authorized professional has personally inspected and verified that the site has been stabilized following the first full growing season (i.e., April through October) in the year following completion of the construction project.
- Ensuring that any transfer of the registration comply with the requirements of Section 5(m) of the general permit.

These recommendations are by no means intended to be exclusive. To help address the issues noted above, the Commissioner will also be considering the posting of a performance bond or other security, in accordance with Section 22a-6(a)(7) of the Connecticut General Statutes, to assure the solar farm construction project maintains compliance with the terms and conditions of the general permit and the SWPCP.