



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

www.ct.gov/csc

VIA ELECTRONIC MAIL

August 1, 2017

David W. Bogan, Esq.
Locke Lord LLP
20 Church Street
Hartford, CT 06103

RE: **PETITION NO. 1310** - Quinebaug Solar, LLC petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed construction, maintenance and operation of a 50 megawatt AC solar photovoltaic electric generating facility on approximately 561 acres comprised of 29 separate and abutting privately-owned parcels located generally north of Wauregan Road in Canterbury, Connecticut and south of Rukstela Road and Allen Hill Road in Brooklyn, Connecticut.

Dear Attorney Bogan:

The Connecticut Siting Council (Council) requests your responses to the enclosed questions no later than August 22, 2017. 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.

Yours very truly,

Melanie A. Bachman
Executive Director

MB/MP/lm

c: Aaron Svedlow, Project Director – Solar Development, Quinebaug Solar, LLC
Council Members

**Petition No. 1310
Interrogatories
Set One
August 1, 2017**

Notice

1. Under Tab G of the Petition, Quinebaug Solar, LLC (QS) included 13 letters from abutting property owners indicating that they do not object to the proposed project. Provide a list of the names and addresses of the signatories of such letters.

Project Development

2. When was the proposed project submitted as a proposal for the Tri-State Clean Energy RFP? When was the proposed project selected?
3. Does the Petitioner have a contract to sell the electricity it expects to generate with the proposed project? If so, to which public utility? Was a Power Purchase Agreement (PPA) approved by PURA? When? Are there provisions for any extension of time in the PPA?
4. What is the length of the PPA, if applicable? Is there an option to renew?

Proposed Site

5. What are the existing land uses in each direction from the proposed site, e.g. north, south, east, and west?
6. Has the State of Connecticut Department of Agriculture purchased any development rights for the proposed site as part of the State Program for the Preservation of Agricultural Land?
7. Is any portion of the site currently in productive agricultural use? If so, how many acres and is it used by the property owner or is it leased to a third party? Could the project qualify under the Agricultural Virtual Net Metering Program or other agriculturally-friendly renewable energy program?
8. Does the proposed site contain any Connecticut Prime Farmland and/or Important Agricultural Soils? If so, what acreage of prime and important soils would the facility and associated equipment be located on?
9. Is there any environmental contamination on the proposed site from any previous agricultural use or other land use disturbance (ex. Soil and/or water contamination)? If so, how would the petitioner remediate the pre-existing soil and/or water contamination?
10. Is the site parcel, or any portion thereof, part of the Public Act 490 Program? If so, how does the town land use code classify the parcel(s)? For example, is/are the parcel(s) classified as "Tillable D – good to fair"?

11. Have any residential subdivisions or other land use plans been approved by the town for the site in the past? If so, please submit the approved plans. If not, could a residential subdivision or other land use plan be constructed at the site? If so, please provide an overlay map depicting the details of a potential residential subdivision or other land use plan for the site using maximum development potential allowed by the town's zoning regulations.
12. Where is the nearest recreational area from the proposed site? Describe the visibility of the proposed project from nearby recreational areas.
13. Where is the nearest area of historical significance or archaeological sensitivity from the proposed site? Describe the visibility of the proposed project from nearby historic or archaeological areas.
14. What is the status of the Phase 1B Survey and its submission to the State Historic Preservation Office (SHPO) for review?
15. Where is the nearest off-site residence in Brooklyn located? Provide the distance, direction, and address of such off-site residence.
16. Where is the nearest off-site residence in Canterbury located? Provide the distance, direction, and address of such off-site residence.

Energy Production

17. What are the percent losses associated with the inverters?
18. On page 19 of ISO-New England, Inc.'s (ISO-NE) Final 2017 Solar PV Forecast, ISO-NE utilizes an AC MW to DC MW (AC/DC Ratio) of 0.83. Is it correct to say that the actual AC/DC Ratio can vary from one solar PV project to the next? Is it correct to say that the AC/DC Ratio of the proposed project is approximately 0.77? Generally, which design considerations were used to determine the AC/DC Ratio of the proposed project?
19. Explain why a solar panel orientation to the south with an angle at 25 degrees above the horizontal was selected for this facility. Is the project designed to maximize annual energy production or peak load shaving?
20. For solar PV, capacity factor is the ratio of net AC megawatt-hours (MWh) output in one year divided by the product of DC megawatts and 8,760 hours per year. What is the projected capacity factor (expressed as a percentage) for the proposed project?
21. What is the efficiency of the photovoltaic module technology of the proposed project?
22. Is a battery or other type of energy storage system proposed? If yes, describe the function of lithium-ion battery or other type of storage system. What prediction methods and reports has QS used to assess total capacity and annual energy production in kilowatt-hours for this project, and how are the proposed batteries or other type of energy storage incorporated into those predictions? Are the batteries or other type of energy storage used to "even out" the energy production, charging during the day and discharging at night, or are they charged during off-peak hours to grant more output during peak hours? Are they simply used to function as a power supply backup?

23. Would the impact of bird droppings, bird feeding habits (ex. Dropping food items such as clams or other prey on the solar panels) or weather events (ex. Snow or ice accumulation, hail, dust, pollen, etc.) reduce the energy production of the proposed project? If so, approximately how much and for how long? Would any of these expose the solar panels to ballistic or other damage? If applicable, what type of methods would be employed to clear the panels of the bird droppings, prey shells, snow and ice accumulation, hail, dust or pollen?
24. Would voltage and current be impacted by soft shading of the solar panels, such as air pollution, or hard shading of the solar panels, such as an accumulated solid? If so, would energy production be reduced?

Site Components and Solar Equipment

25. Provide the specifications sheets for a) proposed inverters and b) solar photovoltaic panels.
26. Provide the approximate dimensions for the transformers and inverters, including the heights.
27. What is the design wind speed of the solar panels with the fixed vertical post foundations? What prevents the solar panels from separating from either the racking or the foundation during high winds?
28. Reference Tab G of the Petition. The proposed access roads are identified in red. What is the total length of all of the access roads combined in miles?
29. 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?

Interconnection

30. Is the project listed on the most recent ISO-NE Regional System Plan Project List? If so, what is the project identification number?
31. Would all of the power produced go to the grid or would any be for internal use? Would the power produced by the project be used regionally, locally or both?
32. Page 3-8 of the Petition references "the point of interconnection will be located at a new Eversource substation located east of the project site." Please explain.
33. Would the 115-kV transmission connection from the Project Transformer to Eversource's existing 115-kV transmission line be overhead or underground?
34. On page 3-7 of the Petition, QS notes that, "A draft System Impact Study (SIS) has been completed and a SIS Review Meeting is scheduled for early June with ISO-NE." What is the status of the SIS? Does the Petitioner have an Interconnection Agreement and with whom?

35. If applicable, since the proposed project would connect to the electric transmission system, has QS received a determination of no significant adverse impact to the transmission system from the ISO-NE Reliability Committee? If yes, please submit a copy of such determination letter. If no, approximately when is a determination anticipated?

Public Safety

36. Would the solar plant have a protection system to shut the plant down in the event of a fault within the facility or isolate the facility during abnormal grid disturbances or during other power outage events?
37. Would the project comply with the National Electrical Code, the National Electrical Safety Code and any applicable National Fire Protection Association codes and standards?
38. Would the Development Area fence utilize an anti-climb design?
39. Would the inverters be "staged" such that only the minimum required number would be on at a given time depending on solar power production, or, generally, would all 33 inverters be operating at the same time? Notwithstanding, does the Acoustic Analysis under Tab O conservatively assume the worst-case scenario of all inverters operating at the same time?
40. Under Tab O of the Petition, the Acoustic Analysis notes a DEEP Daytime Noise Control Sound Limit of 55 dBA. What class of emitter does QS consider the proposed project, e.g. Class A, B, or C?
41. Would the proposed project meet the applicable DEEP Noise Control Standards at the property boundaries?
42. Would glare from the panels present a problem for any nearby properties? Can plantings be used to buffer the visibility of and/or glare from the solar arrays?
43. Would glare from the solar panels attract birds (ex. appear as water) and create a collision hazard?
44. Did the Petitioner conduct a Shade Study Analysis? Would shading present any challenges for the proposed project? Is most of the tree clearing to accommodate the project itself, or is some percentage of the tree clearing (e.g. to the south) associated with minimizing shading of the panels? Explain.
45. Where is the nearest airport and/or airfield? Would glare from the solar arrays have any impact on air navigation? Has a glare analysis been conducted?
46. Is it correct to say that the Federal Aviation Administration (FAA) correspondence under Tab P of the Petition is related to the height and location of the facility and is unrelated to a glare analysis?
47. Would a crane be required for any portion of construction, e.g. to set the Project Transformer in place? If yes, would that necessitate construction notice to FAA for the height(s) of such temporary crane equipment?
48. Would the proximity of any existing or proposed outbuildings, structures, etc. present a fire safety or other hazard (ex. lightning strike)? Would the proximity of any existing or proposed outbuildings, structures, etc. present a hazard in relation to the electric generating equipment?

49. Is outreach and/or training necessary to local emergency responders in the event of a fire or other emergency at the site? How would site access be ensured for emergency responders? 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?

Environmental

50. Under Tab Q of the Petition, QS notes that, "The Project has a nameplate capacity of 65 MW DC and is expected to produce approximately 142,350,000 kilowatt-hours (kWh) per year. According to the EPA Greenhouse Gas Equivalencies calculator, the energy produced will be sufficient to offset approximately 100,000 metric tons of carbon..." Are those kWh based on DC or AC? Does QS agree that it is appropriate to utilize kWh AC for this analysis because only AC power can flow into the grid, displace traditional grid generation and result in carbon emissions reductions? If necessary, recalculate the Tab Q Carbon Debt Analysis using kWh AC.
51. Provide the carbon debt payback period. Specifically, the U.S. Environmental Protection Agency (EPA) estimates that 1.06 metric tons of carbon dioxide are sequestered by one acre of average U.S. forest in one year. That number can be multiplied by the number of acres of trees to be cleared to estimate the annual loss of carbon dioxide sequestration in metric tons per year for the project. Then the total projected annual electrical production in kWh AC for the solar facility can be multiplied by the EPA estimate of 7.03×10^{-4} metric tons of carbon dioxide displaced per kilowatt-hour in order to provide the annual carbon dioxide emissions avoided by the operation of solar plant. Based on this or a different analysis, compute the number of months or years it would take to "break even" with carbon dioxide or when the carbon dioxide emissions reductions would equal the sequestration loss. (Data source: <http://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references>)
52. Under Tab M of the Petition, QS has included a letter from DEEP dated October 7, 2016 regarding its preliminary review of the Natural Diversity Database (NDDB). To date, has QS received any follow-up correspondence from DEEP regarding the NDDB?
53. Provide the total tree clearing area in upland areas and the total tree clearing area in wetland areas, if applicable.
54. Based on the February 1, 2016 DEEP Map entitled "Northern long-eared bat (NLEB) areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance," is it correct to say that there would be no tree clearing within 0.25 miles of a known NLEB hibernaculum?
55. Page 3-4 of the Petition notes that, "The vast majority of activities associated with the Project will occur a minimum of 50 feet from all mapped wetlands or watercourses." What is the closest distance from the proposed fence line to a wetland, and where is it located? What is the closest distance from the proposed fence line to a watercourse, and where is it located?
56. Is it correct to say that the proposed project would not be located within a DEEP-designated aquifer protection area? Are there any wells on the site or in the vicinity of the site? If so, how would the petitioner protect the wells and/or water quality from construction impacts.
57. Is any portion of the proposed project located within a 500-year flood zone? Provide Federal Emergency Management Agency flood zone map(s) that includes the proposed project.
58. Would the solar panels "heat" rainwater and potentially thermally pollute wetlands?

59. Would the proposed project adversely impact The Last Green Valley National Heritage Corridor as identified by the National Park Service? Explain.
60. What is the length of the posts and to what depth would the posts be driven into the ground to provide structural stability? Are any impacts to groundwater anticipated? If so, how would the petitioner manage and/or mitigate these impacts?

Construction Questions

61. If applicable, could tree clearing, grubbing, grading, excavation, filling and dewatering, be performed in stages (e.g. five acres at a time)? Why or why not? (Note: Connecticut Department of Energy and Environmental Protection "DEEP" General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities states that, "Whenever possible, the site shall be phased to avoid the disturbance of over five acres at a time...")
62. Will grading be required? If so, is it possible to install the facility with minimal alteration to existing slopes? If not, could existing vegetation be maintained/managed?
63. Estimate the amounts of cut and fill in cubic yards for a) access roads and b) general site grading, if applicable.
64. How would the vertical posts (that would support the solar arrays) be driven into the ground? In the event that ledge is encountered, what methods would be utilized (ex. Mechanical chipping or blasting) or would relocation of the posts be utilized instead of chipping or blasting?
65. What is the anticipated sequence of construction? During what time of year would each sequence ideally occur? Does this account for possible seasonal construction restrictions due to the presence of protected species?
66. Is it possible that some Sunday construction hours might be necessary due to unforeseen conditions such as inclement weather, transmission outage constraints and/or critical path activities? If the project is approved, could the final construction hours be included in the D&M Plan?
67. Would a Construction General Permit from DEEP, or other type of permit, be required?
68. Would the stormwater design be installed in phases to control stormwater flows onto adjacent properties during construction?
69. Has the petitioner considered provisions to handle stormwater during/following a rain event during construction? Are temporary swales and/or basins proposed?
70. How did QS determine the designation of the main construction access road over other possible entrances from public roads? Could the main construction access road be relocated? If so, where? If not, could the main construction access road be paved?

Maintenance Questions

71. How would the Petitioner handle potential snow accumulation on the panels and any effects of blocking the sunlight?

72. 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? What accumulation of snow could the structures handle? Would the Petitioner clear snow from the panels when it approached the limit?
73. Would the petitioner adhere to any seasonal restrictions on mowing due to the presence of protected species?
74. Would the installed solar panels require regular cleaning or other, similar, maintenance? How would this be accomplished? Would this maintenance activity have any impacts to water quality?
75. What are the impacts of the grass on erosion? Would the site be hydro-seeded?
76. Could the petitioner establish post-construction site restoration/revegetation that includes the incorporation of model pollinator habitat?
77. How would the proposed project impact traffic? Specifically, about how many construction vehicles per day would be expected to visit the site during construction? Once the facility is operational, estimate the number and frequency of vehicles visiting the site for operation and maintenance.