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May 25, 2018

VIA EMAIL and US MAIL

Melanie Bachman
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: GRE GACRUX LLC Petition for a Declaratory Ruling, Pursuant to Connecticut General Statutes §4-176 and §16-50k, for the Proposed Construction, Maintenance and Operation of a 4.98 MW AC Ground-mounted Solar Photovoltaic Electric Generating Facility Located on Middletown Avenue in North Haven, Connecticut

Dear Ms. Bachman:

My client, GRE GACRUX LLC, hereby submits an original and 15 copies of its responses to the Council's Interrogatories related to the Petition for a Declaratory Ruling with the Siting Council for the proposed construction, maintenance and operation of a 4.98 MW AC ground-mounted solar photovoltaic electric generating facility located on Middletown Avenue in North Haven, Connecticut.

If you have any questions concerning this submittal, please contact the undersigned at your convenience. I certify that copies of this submittal have been submitted to the Towns of North Haven, East Haven and North Branford.

Sincerely,

Lee D. Hoffman

Lee D. Hoffman

Enclosures

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Petition of GRE GACRUX LLC for a Declaratory Ruling pursuant to C.G.S. §4-176 and § 16-50k, for the proposed construction, maintenance and operation of a 4.98 MW AC ground-mounted solar photovoltaic electric generating facility located at 232 Rimmon Road And 700 Middletown Avenue in North Haven, Connecticut

Petition No. 1342

May 25, 2018

GRE GACRUX LLC'S RESPONSES TO THE CONNECTICUT SITING COUNCIL'S FIRST SET OF INTERROGATORIES

The petitioner, GRE GACRUX LLC ("GRE" or "the Petitioner"), respectfully submits this response to the Connecticut Siting Council's First Set of Interrogatories in the above-referenced Petition. In response to the Siting Council's Interrogatories, GRE states as follows:

Notice and Municipal Consultation

1. **Referencing the notification package dated April 18, 2018, was a copy of the Petition served on the Town of North Haven Conservation Commission?**

   No. A full copy of the Petition was served on the Town of North Haven, but not on the Town of North Haven's Conservation Commission. The Town of North Haven's Conservation Commission was notified of the Petition on May 15, 2018.

2. **Have any written comments been received from the Town of North Haven? Have any comments been received from abutters/neighbors to the proposed project?**

   GRE has received no written comments from the Town of North Haven. GRE received one written communication from an abutter, located at 242 Rimmon Road in North Haven, indicating that he did not want the Project located near his home. Representatives from GRE have since communicated with that neighbor to discuss potential visual screening that could be done, both on the Project site, or if the neighbor prefers, on the neighbor's property. GRE has also had verbal consultations with other neighbors, largely focused on how visual screening will be completed. To date, all of those conversations have been positive, with GRE and neighbors coming to agreement on the visual screening mechanisms that will be used.

Project Development

3. **If the project is approved, identify all permits necessary for construction and operation and which entity will hold the permit(s).**

   Please see attached Exhibit 1.

4. **Does the Petitioner have a contract to sell the electricity and renewable energy certificates (RECs) it expects to generate with the proposed project to The United Illuminating Company (UI) and Eversource? Provide the percentage (of the energy and RECs) to be sold to each public utility.**

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that approximately 80% of the Project's electricity and RECs will be sold to Eversource Energy, with the remaining 20% to be sold to the United Illuminating Company.

5. **What authority will approve a power purchase agreement (PPA) for the facility? When?**

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the Connecticut Public Utilities Regulatory Authority approved the PPA on September 7, 2017.

6. **What is the length of the power purchase agreement? Are there provisions for any extension of time in the PPA? Is there an option to renew?**

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the PPA as approved has a length of twenty (20) years, and that there is no option for any length of renewal.

7. **Is the alternating current megawatt capacity of the facility fixed at a certain amount per the PPA and/or the RFP?**

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that the PPAs add up to 4.98 MW of capacity. The RFP called for less than 20 MW of solar power.

8. **Would the petitioner participate in the ISO-NE Forward Capacity Auction? If yes, which auction(s) and capacity commitment period(s)?**

   GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that there is potential, but no obligation, for the Petitioner to participate in the ISO-NE Forward Capacity Auction. ISO-NE Forward Capacity Auction 13 would be the first auction the Petitioner could participate in. The Petitioner currently has no plans to participate in the ISO-NE forward capacity auction.

Proposed Site

9. **What is the current land use of the host property?**

   To the best of GRE's knowledge the host property is currently unimproved, vacant land that is not currently in use.

10. **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?**

    GRE objects to this Interrogatory as the Interrogatory exceeds the scope of a petition for declaratory ruling pursuant to Conn. Gen. Stat. §§4-176 and 16-50K. Subject to the foregoing objection, GRE states that it is GRE's understanding that the site is participating in the P.A. 490 program. Half of the site is classified as Forest and the other half is classified as Tillable B. However, as indicated on page 14 of GRE's Petition, the Project is not located on any prime farmland. It is anticipated that the Project will likely affect the land use classification, however the project will sign a tax agreement with the town that resolves any potential issues relating to land classification.

11. **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?**

    To the best of the Petitioner's knowledge, no agricultural rights have been purchased.

12. **Where is the nearest recreational area from the proposed site? Describe the visibility of the proposed project from this recreational area.**

    Hansen Park is located approximately 0.4 miles north of the Project site. The Project is not anticipated to be generally visible from the park, however, there may be some minimal visibility from the trail on the south side of the park during leaf-off conditions. No glare is anticipated given the low-glare characteristics of the panels and the fact that the panels will face south.

13. **The buffer from the proposed fence line to the Alfonso Camara property to the east is about 36 feet. Could the footprint project footprint be modified to increase the distance to that property?**

    The footprint is currently designed to account for the most efficient design that will yield to maximum power. While the footprint can be altered, it will result in solar modules being placed elsewhere on sloped terrain that will affect power output

14. **On Sheet CS-1, the Petitioner provided site lines to the four closest abutting property owners and landscape plans on Sheets LL-1 and LL-2 to mitigate such impacts. Would the remaining abutting residential property owners have their views of the facility screened by existing vegetation?**

    GRE believes that the existing landscaping will be sufficient to screen the views of the facility. Nonetheless, GRE's representatives have been in conversations with these abutting property owners concerning potential visual impacts. GRE will provide those individuals with vegetative screening should they request additional screening.

15. **Page 4 of the Phase 1A Cultural Resources Assessment Survey (Phase 1A Survey) indicates that the site contains Windsor Soils. However, pages 14 and 15 of the Petition indicate that the site contains Ellington and Manchester Soils. Explain why Windsor Soils are referenced in the Phase 1A Survey. How many acres of each soil type would the project be located on? What impacts, if any, would the proposed project have on the soil productivity of the site?**

On Page 4 of the Cultural Resources Assessment Survey (Phase 1A Survey) submittal, Heritage Consultants, LLC inadvertently referred to the presence of Windsor Soils in the site area. The discrepancy between the Phase IA Survey and the Petition has been corrected, as Windsor soils do not exist in the study area. Heritage Consultants, LLC offers the revised soils section of Chapter II of the Phase IA survey below. This revised statement correctly identifies the presence of Ellington and Manchester soils in the study area.

Soils Comprising the Study Area
Soil formation is the direct result of the interaction of a number of variables, including climate, vegetation, parent material, time, and organisms present (Gerrard 1981). Once archaeological deposits are buried within the soil, they are subject to a number of diagenic processes. Different classes of artifacts may be preferentially protected, or unaffected by these processes, whereas others may deteriorate rapidly. Cyclical wetting and drying, freezing and thawing, and compression can accelerate chemically and mechanically the decay processes for animal bones, shells, lithics, ceramics, and plant remains. Lithic and ceramic artifacts are largely unaffected by soil pH, whereas animal bones and shells decay more quickly in acidic soils such as those that are present in within the current study area. In contrast, acidic soils enhance the preservation of charred plant remains.

A review of the soils within the study area is presented below. The study area is characterized by the presence of two major soil types: Ellington and Manchester soils (Figure 3). Both soil types are well correlated with both historic and prehistoric archaeological site locations. Descriptive profiles for each, which were accessed via the National Resources Conservation Service, are presented below.

Ellington Soils:
Ap--0 to 8 inches; dark reddish brown (5YR 3/2) silt loam; pinkish gray (7.5YR 6/2) dry; weak medium granular structure; friable; few fine roots; 5 percent gravel; slightly acid; clear smooth boundary; Bw1--8 to 18 inches; reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent gravel; moderately acid; gradual wavy boundary; Bw2--18 to 26 inches; reddish brown (5YR 4/4) very fine sandy loam; massive; friable; 10 percent gravel; common medium distinct reddish gray (5YR 5/2) iron depletions and dark red (2.5YR 3/6) masses of iron accumulation; strongly acid; abrupt smooth boundary; and 2C--26 to 65 inches; dark reddish brown (5YR 3/4) stratified sand and gravel with a few thin lenses of sandy loam; single grain; loose; 50 percent gravel; few fine distinct reddish gray (5YR 5/2) iron depletions and few fine faint yellowish red (5YR 4/6) masses of iron accumulation; strongly acid.

Manchester Soils:
Ap--0 to 9 inches; dark brown (7.5YR 3/2) gravelly sandy loam; weak medium granular structure; very friable; many fine and common medium roots; 20 percent gravel; strongly acid; clear smooth boundary; Bw--9 to 18 inches; reddish brown (5YR 4/3) gravelly loamy sand; very weak fine and medium granular structure; very friable; few fine roots; 25 percent gravel; strongly

acid; clear wavy boundary; and C--18 to 65 inches; reddish brown (5YR 4/4) very gravelly sand; single grain; loose; 50 percent gravel; very strongly acid.

16. **Has the project developer discussed any potential restoration methods to be employed at the end of the project's useful life with the property owner?**

    No specifics of restoration have been discussed with the land owner. The project will return the land to pre-solar state as much as possible and in a way agreeable to owner once life of project ends.

17. **Reference pages 19 and 20 of the Phase 1A Survey. Provide the distance and describe the visibility of the proposed project from The Rising Sun Tavern, a National Register of Historic Places resource.**

    The distance from the southern edge of our property to the Tavern is approximately 250 feet, which is located on the south side of Old Tavern Road, which is a diagonal road off the southern side of Middletown Avenue. Due to the existing trees and vegetation that existing along our southern property line, as well as the existing trees and vegetation between Middletown Avenue and the Rising Sun Tavern, there is not anticipated to be any visibility of the proposed solar field from that vantage point.

18. **An existing dirt path that originates off of Old Velvet Street and travels roughly northwest would be covered, in large part, by the proposed project footprint. Are there any known existing easements associated with the use of this dirt path?**

    There are no known existing easements associated with the use of this dirt path.

Energy Production

19. **Identify the loss assumption(s) for the proposed project. For example, would the proposed facility provide 4.98 MW AC at the point of interconnection?**

    There will be negligible losses between AC generators and point of interconnection.

20. **What is the AC/DC ratio of the proposed project? What design considerations were used to determine the AC/DC ratio of the proposed project?**

    The DC capacity is slightly higher than the AC capacity, giving a ratio of 5.97 kWDC to 4.98 kWAC, which is an AC/DC ratio of 1.2. 1.13. The goal of the Project is to maximize both the AC and DC power outputs and maintain highest energy yield possible.

21. **Explain why a solar panel orientation to the south with an angle of 30 degrees above the horizontal was selected for this facility. Is the project designed to maximize annual energy production or peak load shaving?**

    The Project is designed to maximize annual energy production. 30 degrees allows for high production in both winter and summer, results in snow shedding, and does not create structural issues for racking.

22. **Page 16 of the Petition notes that, "The panels will be tilted toward the southern sky at an approximate angle of 10 degrees." However, Sheets SP-1 and DN-1 depict a 30 degree**

angle. Clarify which angle is correct. If 30 degrees is not correct, please revise Sheets SP-1 and DN-1 accordingly.

Thirty degrees is the correct angle, therefore the sheets referenced above are correct. As a result, page 16 of the Petition should be revised to read, "The panels will be tilted toward the southern sky at an approximate angle of 30 degrees."

23. **What is the projected capacity factor (expressed as a percentage) for the proposed project?**

Approximately 14%.

24. **What is the efficiency of the photovoltaic module technology of the proposed project?**

The current design utilizes 19.4% efficient modules, but is subject to availability at the time of procurement.

25. **What is the efficiency of the inverters?**

Approximately 98 %

26. **Would the power output of the solar panels decline as the panels age? If so, estimate the percent per year.**

Yes, degradation is expected at approximately 0.5% per year.

27. **Page 11 notes a 35-year design life. However, the Decommissioning and Restoration Plan (DRP) notes an expected operational life of at least 30 years. Is the "operational life" conservatively less than the "design life?" Explain.**

The Decommissioning and Restoration Plan was conservative, since not all factors concerning the longevity of the panels can be known at this time. While the Project does have a 35-year design life, it is possible that the Project may not be viable after 30 years. Hence, the Decommissioning and Restoration Plan contemplates "at least" 30 years, which is the most conservative estimate of the lifespan of the Project.

28. **Can the project be designed to accommodate future potential battery storage? If so, please describe the function of the battery or other type of storage system? What prediction methods and reports has the petitioner used to assess total capacity in megawatts 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?**

No battery or other storage is proposed for the Project at this time. No studies have been done to-date assessing the impact of including battery storage in Project design.

29. **Could the project be designed to serve a microgrid?**

In theory all solar projects can serve a microgrid from a technology perspective. This specific project is approved for interconnection with United Illuminating Company's power grid and thus will not be serving any microgrids.

30. **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? If applicable, what type of methods would be employed to clear the panels of the bird droppings, prey shells, and ice accumulation, hail, dust or pollen and at what intervals?**

Soiling of the panels as a result of snow, ice, bird droppings, and other factors can reduce the gross output of the facility. These losses were included in the modeled system production. Consistent with projects operating in the region, the Petitioner's expectation is that seasonal rains will help to keep the panels clean, and snow removal will not be required on a regular basis. Occasional washing with water can be completed on an as-needed basis. None of the items mentioned are expected to damage the panels.

Site Components and Solar Equipment

31. **Provide the specifications sheets for a) proposed inverters and b) solar photovoltaic panels.**

The specific inverters and solar photovoltaic panels have not yet been selected at this time. Final equipment selection will be made in conjunction with final detailed engineering. Given the ever-changing nature of the industry, such selections would be premature at this juncture; however, it would be anticipated that if the Council approves this Petition, such information would be provided to the Council as part of the Petitioner's D&M Plan submittal to the Council. Indicative specification sheets are provided in Exhibit 2.

32. **Sheet DN-1 depicts an aisle width of about 15 feet between rows of solar panels. Would this aisle width be expected to remain roughly uniform, or would it vary because the site slopes from roughly south to north?**

The aisle widths are expected to remain roughly uniform.

Interconnection

33. **What is the status of the Interconnection Application that has been submitted to UI?**

UI has completed its design review and is in process of commencing the impact study.

Public Safety

34. **Would the project comply with the National Electrical Code, the National Electrical Safety Code and any applicable National Fire Protection Association codes and standards?**

The Project will be designed to comply with applicable codes and standards from the National Electrical Code ("NEC"), the National Electrical Safety Code and the National Fire Protection Association ("NFPA") code as required by the local authority having jurisdiction.

35. **On March 29, 2018, the Federal Aviation Administration (FAA) received the Petitioner's request for a "No Hazard Determination." What is the status of such FAA review?**

The request is currently under review. The FAA requested that GRE file additional requests for the opposite side of array as well as utility poles. GRE provided this information to the FAA on

April 16, 2018, and is awaiting confirmation from the FAA that the Project does not present a hazard to air navigation.

36. **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? If not, under what circumstances would a FAA glare analysis be required?**

The closest airport is the Tweed New Haven airport, which is located approximately 7.5 miles from the Project. The solar panels are blue/black, and no other colors are available. Any light reflecting off of the solar panels is light that will not be converted by the panels into electricity. Therefore, it is the Petitioner's desire, and the industry's goal in general, to make PV panels be as non-reflective as possible. That having been said, there are no 100% non-reflective solar panels on the market today. The Petitioner anticipates that it will be using panels with a casing on the panels which is approximately 8% reflective. There has been no glare analysis conducted, and it is not anticipated that the FAA will require a glare analysis.

37. **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?**

Minimum distances and clearances according to NFPA 70 will be followed to ensure a safe, reliable installation.

38. **Would the disconnect switches referenced on page 16 of the Petition be used in lieu of an emergency key box so that first responders can shut down the facility in the event of a fire, or would there be a separate key box? Explain.**

It is currently GRE's intent that the disconnect switches would be used in lieu of an emergency key box, however, discussions with the Town's first responders are ongoing. GRE will provide the Town's first responders with their preferred means of access to the site and for shut down of the Project, which could include a key box, should the first responders so desire.

Environmental

39. **Page 4 of the Petition notes that tree removal is not required. Page 12 of the Petition notes that, "[T]here will be a limited need for tree clearing…" Is it correct to say that during the field review on May 3, 2018, approximately one tree was identified to be removed? If no, please provide the correct tree clearing area in acres (or number of trees six inches or greater in diameter if the number is small). Would all tree removal be performed in upland areas? If no, approximately how many acres of tree clearing in wetland areas are expected? How would clearing in wetlands be accomplished?**

It is correct to say that only one tree is marked for removal.

40. **Did the Petitioner conduct a Shade Study Analysis? Would shading present any challenges for the proposed project? If so, how many trees will be removed to mitigate for shading?**

A shade analysis was completed in production modeling, and shading is not anticipated to present challenges. No trees will be removed to address shade concerns.

In designing the Project, the Petitioner considered the impacts of shading and incorporated these concerns into the definition of the Project Area and the placement of solar panels and other Project structures. The Petitioner used strategies to account for shading impacts, such as setting the solar panels back from the Project fence line and using string inverters. Other than one single tree in the middle of the project area, no additional trees are expected to be removed.

41. **What is the current status of the NDDB Surveys for the two Species of Special Concern: eastern box turtle and ground beetle?**

These additional studies are underway in the field, and GRE anticipates receiving findings by the end of June. GRE can provide these findings to the Siting Council as part of the D&M Plan, or in another format if the Siting Council prefers.

42. **If applicable, would the Petitioner comply with any DEEP recommended seasonal construction restrictions due to the presence of any protected species on the site?**

Yes.

43. **Would construction of the proposed facility involve disturbance of one or more total acres of land area? If yes, has the Petitioner submitted an application for a General Permit to the Department of Energy and Environmental Protection?**

The proposed facility is anticipated to involve the disturbance of one or more total acres of land area. The Petitioner has not yet submitted its application for a General Permit to the Department of Energy and Environmental Protection ("DEEP") for this project. The Petitioner met with DEEP stormwater permitting staff on April 23, 2018 to discuss this project, and anticipates filing the application for the General Permit prior to construction activities.

44. **The Wetland Delineation Maps on page 21 and Tab H of the Petition indicate that the eastern portion of Wetland 2 would be located under the solar panels. However, the Site Plan Sheet SP-1 shows that the project footprint would avoid Wetland 2. Also, the Wetland Delineation Maps show a different solar array and access drive configuration, particularly to the west. Please confirm which one is correct.**

Plan Sheet SP-1 is correct. The map in the petition was prepared during the initial field investigation by Davison Environmental, based on the Concept Plan available at that time. If necessary, GRE can update wetland map to reflect the current layout as part of its D&M Plan.

45. **What is the status of the vernal pool study? Were any vernal pools or potential vernal pools identified on the proposed site? Are any wetland and/or vernal pool protective measures proposed?**

Davison Environmental conducted vernal pool surveys of all onsite wetlands during April and May of 2018. No vernal pools are present on the site. The results of this work will be documented in the wetlands and biological report that is in the process of being prepared.

46. **Has the Petitioner considered a larger wetland buffer than 50 feet? Explain.**

The Town of North Haven Inland Wetland regulatory wetland setback area is 50 ft. The existing farming use includes disturbance within 10-15 feet of the wetlands in some instances. The final proposed development will include a 25-ft wide vegetative filter strip beyond the 50-ft buffer between the perimeter fence and the wetland buffer creating a de facto 75-ft wide buffer. The proposed buffer between the perimeter fence and the southern inland wetland adjacent to Old Velvet Road will be in excess of 100-ft. (consult with Davison Environmental).

47. **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.**

    There are no wells on the subject property. Based upon available information it appears that abutting properties may be serviced by domestic wells. There should be negligible impacts to water quality from construction related activities as erosion controls will be in place to minimize the transport of sediment. Additionally, the surrounding residential properties are located upgradient of the site. Groundwater flow typically mimics the direction the topography and surface runoff which in this case flows down gradient in a westerly, northwesterly direction, away from the surrounding residential properties.

48. **Sheet EC-1 depicts a construction wash pit on the west side of the Old Velvet Street entrance near the wetland. Could this pit be moved to the east side of the entrance, farther away from the wetland?**

    The location of the wash pit was chosen on the west side of the access drive, as electrical switchgear work is located on the east side of this drive. It could be relocated, but may affect positioning of electrical items. The proposed wash pit will be located over 100-ft from the inland wetlands.

49. **What effect would runoff from the drip edge of each row of solar panels have on site drainage patterns? Would channelization below the drip edge be expected? If not, why not?**

    The design intent of the drip edge, as depicted in the Drainage Report, is to curtail local erosion and to dissipate the stormwater back to the ground and to facilitate "sheet flow" under the panels. It is not intended to detain stormwater or to act as a "conduit" for stormwater.

50. **On page 4, Appendix B (Stormwater Report), the Petitioner notes that, "The proposed improvements for the project do impact these delineated wetland areas but due to the change in land use, the impact will reduce stormwater runoff and improve the quality of the runoff entering each wetland area." How would this impact the integrity of the wetlands (especially to the east)?**

    The proposed stormwater runoff entering the existing inland wetlands will be filtered through a 25-ft vegetative filter strip before reaching the 50-ft wetland setback which will provide for improved water quality. The discontinuance of the existing agricultural use will result in the elimination of the use of pesticides on site, which contributes to the improved water quality and integrity of the wetlands.

51. **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 quality anticipated? If so,**

how would the petitioner manage and/or mitigate these impacts? If geotechnical review has been performed, what is the approximate groundwater depth at the site?

The geotechnical report for the project indicates that driven posts are feasible, and post embedments are anticipated to be approximatetly 6 feet based on previous similar project conditions. Groundwater was variable in the test pits, ranging from 3 feet below grade to 14 feet below grade. The geotechnical information will be used by the racking vendor to design the actual embedment of the posts, and will be handles as a delegated design during construction. We do not anticipate any impacts to groundwater quality.

52. **Would glare from the solar panels attract birds (ex. Appear as water) and create a collision hazard?**
Research and evidence does not attribute significant mortality to birds due to misinterpreting panels for open water bodies. Please also see the responses to Interrogatory 36 concerning glare.

Construction Questions

53. **Would the proposed access off of Old Velvet Street be the primary construction access, and would the access off of Rimmon Road be the secondary construction access? Explain. Would this remain to be the project access configuration? Explain. Would the Rimmon Road access be improved with gravel (and to the same width as the access off Old Velvet Street)?**

The construction and permanent access to the site is from Old Velvet Road. The gravel drive off of Rimmon Road currently exists, and is maintained only for secondary Owner access. We do not intend or want construction traffic entering the site from Rimmon Road.

54. **Would all laydown areas be on-site? Explain.**

Yes. There are no anticipated laydown areas outside of the Project site**.**

55. **Will grading be required? (The Grading Plan on Sheet SD-1 does not appear to have grading.) What is the desired slope within the solar array area? If so, is it possible to install the facility with minimal alteration to existing slopes?**

GRE's design intent is to follow existing grades as much as possible, with the only proposed change in grades to accommodate some slight modification to handle drainage paths where collected runoff crosses the gravel access drives via proposed culverts.

56. **Estimate the amounts of cut and fill in cubic yards for a) access roads and b) general site grading, if applicable.**

The cut volume for access drive construction is estimated to be approximately 1,600 CY, which will be replaced with subbase material and processed stone. General site grading includes approximately 300 CY of material for grade raise fill at the proposed stormwater crossings. Please also refer to the answer to Interrogatory 55.

57. **Would silt fence work with the existing soils? Would the soil particles be too fine (i.e. small in size) for the silt fence to be effective? If yes, has the Petitioner considered using a silt sock as an alternative?**

The proposed silt fence is Mirafi Envirofence or Propex Geotex, or an approved equal. Both products have an Apparent Opening Size (AOS) of 0.6 mm. The silt fence is not intended to trap all particles but rather to filter sediment from stormwater runoff. Additional protection measures, including silt socks, can be directed by the engineer during construction if needed.

58. **How would the posts (that support the racking system) be driven into the ground? In the event that ledge is encountered, what methods would be utilized for installation?**

The posts are typically driven utilizing a track-mounted pneumatic driving rig. Ledge is not anticipated to be encountered, but in the event that ledge is encountered, the driven posts would be substituted with a ballast design with a concrete base.

59. **Sheet EC-3 and others list permanent stone check dams (and temporary ones) with a maximum height of approximately three feet. How would that impact the panel layout as the bottom of the panels would be about three feet above grade per Sheet SP-1?**

The maximum height of the check dam is anticipated to be three feet, and this height would occur only at the lowest point of the existing drainage swale. If there is a conflict in clearance between the top of the check dam and bottom of the panel, the affected panels can be raised as needed to provide adequate clearance.

60. **Pages 5 through 8 of Appendix B (Stormwater Report) provide the construction sequencing from Phase 1 to Phase 5. During roughly what time of year would these five phases of construction occur?**

GRE has not completed its selection of its construction contractor at this time, so it is not known at roughly what time of year these phases of construction would occur. GRE suggests that this phasing be placed in the Project's D&M Plan.

61. **Has the petitioner considered provisions to handle stormwater during/following a rain event during construction? Are temporary swales and/or basins proposed? Describe the methods to control stormwater flows, including, but not limited to, phasing, basins, etc.**

Sediment and Erosion Control Plan sheet EC-7 details the proposed Phasing Construction Sequence. The project will utilize a combination of perimeter controls, BMPs, and existing drainage swales supplemented with check dams to provide for erosion control during construction.

62. **What are the impacts of planting low maintenance seed mix on stormwater retention?**

Low maintenance seed mixture is a diverse mix of seed which will produce a thick stand of grass when installed properly. These areas will only be mowed 2-3 per growing season, thereby encouraging growth. As the stand of grass and coverage increases over time the curve number of the ground condition will be lowered resulting in less overall runoff as more water is retained through vegetative uptake.

63. **Would the site be hydro-seeded upon completion of construction activities?**

GRE has not yet selected a method of seeding for the completion of construction activities, however, GRE has no objection to hydro-seeding, if that method is deemed to be the best option once construction is completed.

Maintenance Questions

64. **Would snow accumulation on the solar panels affect the output of the facility? If yes, have the effects of snow cover been included in the projected approximately 8,000 MW-hours per year of AC output? While the Petitioner notes that performing snow removal would be rare, describe the snow removal methods that would be employed.**

    Snow is included in the energy model and does decrease the amount of production. The racking design takes snow depth into consideration to avoid drifting or buildup from the ground to cover solar panels. In the event that snow removal is required, the Petitioner will employ sweeping modules and a mini plow to conduct snow removal.

65. **Would any mowing be required under or around the proposed solar panels/modules, and if so, approximately how often would mowing occur? Would the Petitioner adhere to any seasonal restrictions on mowing due to the presence of state species?**

    Mowing may be required and will be executed on an as-needed basis, based upon production monitoring. The solar panel height above ground and seeding mix are intended to minimize the number of times mowing will be required. The Petitioner will adhere to requirements regarding time of year and/or adjustments to blade height.

66. **Describe the type and frequency of vegetation management for the site. Include areas inside and outside of the perimeter fence.**

    Vegetation on the project site will be checked regularly, more often in growing season. Annual comprehensive site inspections will also be conducted. Mowing will be conducted as required.

67. **Page 11 of the Petition notes that, "Module washing is performed on both a scheduled basis as well as a corrective measure if there is a major soiling event." What would constitute a "major soiling event?" How would this be accomplished? Would any chemicals be used or only water? Would this maintenance activity have any impacts to water quality?**

    A major soiling event is described by an impact on production as noticed by the monitoring system that would have an economic impact higher than the cost of cleaning. The modules would be cleaned the same as any other time using nothing more than water. No chemicals would be used, so there would be no anticipated impacts to water quality.

68. **Page 9 of the Petition notes that, "Restoration of the Project Area is proposed to include new low-maintenance ground cover within the solar array field and adjacent to the perimeter fencing." Specifically, would grass be planted in the fenced solar array area (and adjacent to the fencing)? If so, what types? How would the grass/vegetative growth be controlled to keep the solar panels clear? Describe the maintenance of the grass/vegetative surface in the fenced solar field area.**

    Low growth grass and/or flower mix will be planted throughout the fenced in solar array area including beneath and between rows of modules. The exact plant type is not yet defined. All

vegetation within the fenced area will be mowed to a length to prevent shading of solar modules as well as prevent fire risk.

Respectfully Submitted,
GRE GACRUX LLC

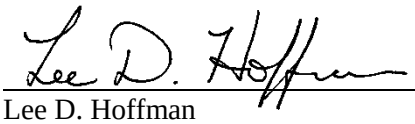
By: 

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Exhibit 1– Permits for Construction and Operation

Permit	Authority	Entity to Hold Permit
Federal		
Exempt Wholesale Generator (EWG) Status	Federal Energy Regulatory Commission (FERC)	GRE GACRUX LLC
Determination of No Hazard to Air Navigation	Federal Aviation Administration (FAA)	GRE GACRUX LLC
State		
Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need is not Required	Connecticut Siting Council (CSC)	GRE GACRUX LLC
Approval of Development and Management Plan	Connecticut Siting Council (CSC)	GRE GACRUX LLC
General Permit for Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities	Connecticut Department of Energy and Environmental Protection (CTDEEP)	Construction contractor and/or GRE GACRUX LLC
Qualification as a RPS Class I Renewable Generation Unit	Connecticut Public Utilities Regulatory Authority (PURA)	GRE GACRUX LLC
Local		
Town of North Haven	Building and Electrical Permit	Construction contractor and/or GRE GACRUX LLC

Exhibit 2– Indicative Specifications

See attached sheets for inverters and panels.

YASKAWA

SOLECTRIA XGI 1000

Premium 3-Ph Transformerless Commercial String Inverters

Features

- Made in the USA with global components
- Buy American Act (BAA) compliant
- 60kW and 65kW
- Built to last
- Lowest cost of labor/installation
- Access to all inverters on-site via WiFi from one location
- Lowest cost of O&M
- Remote diagnostics
- Remote software & firmware upgrades
- 5-90° installation angles
- 4 MPPTs
- Advanced grid functions
- Integrated AFCI

Options

- Plug & play MC4 or H4 connectors
- Web-based monitoring
- Revenue grade metering
- Extended warranty

Yaskawa Solectria Solar's XGI 1000 commercial string inverters are designed for high reliability and built of the highest quality components. Components were selected, tested and proven to last beyond their warranty. The XGI 1000 inverters provide advanced grid-support functionality and meet the latest IEEE 1547 and UL 1741 standards for safety. Offering a wide mounting-angle range (5 – 90° from horizontal), the XGI inverters can be installed to meet array-level rapid shutdown requirements of the NEC. Designed and engineered in Lawrence, MA, the new XGI inverters are assembled and tested at Yaskawa America's facilities in Buffalo Grove, IL. The all new XGI 1000 inverters are Made in the USA with global components, and are compliant with the Buy American Act.

Made in the USA
with global components

SOLECTRIA SOLAR

SOLECTRIA XGI 1000

Specifications

	XGI 1000-60	XGI 1000-65
DC Input		
Absolute Maximum Input Voltage	1000 VDC	
Maximum Power Input Voltage Range (MPPT)	580-850 VDC	600-850 VDC
Operating Voltage Range (MPPT)	350-950 VDC	
MPP Trackers	4 (factory default is 1 zone)	
DC Connections (Fused Options)	4 per MPPT	
Maximum PV Current (Isc x 1.25)	Independent Zones: 50 A per MPPT; Parallel Zones: 180 A	
Maximum Operating Input Current	105.6 A (26.4 A per zone)	110.6 A (27.65 A per zone)
Maximum Operating PV Power (per MPPT)	15.3 kW	16.6 kW
Maximum Recommended DC to AC Ratio	1.5	
Maximum Rated PV Input (per MPPT)	22.5 kW	24.4 kW
AC Output		
Nominal Output Voltage	480 VAC, 3-Ph	
AC Voltage Range	-12/+10%	
Continuous Output Power	60 kW	65 kW
Continuous Apparent Output Power	60 kVA	65 kVA
Maximum Output Current	72.2 A	78.2 A
Nominal Output Frequency	60 Hz	
Power Factor	Unity, >0.99 (Adjustable -0.85 to +0.85), factory set at 1	
Total Harmonic Distortion (THD) @ Rated Load	<3%	
Grid Connection Type	3-Ph + N/GND	
Fault Current Contribution (1 cycle RMS)	93.9 A RMS	101.7 A RMS
Efficiency		
Peak Efficiency	98.2%	
CEC Efficiency	98.0%	
Tare Loss	<1 W	
Temperature		
Ambient Temperature Range	-40°F to +140°F (-40°C to +60°C); derate at +122°F (+50°C)	-40°F to +140°F (-40°C to +60°C); derate at +113°F (+45°C)
Storage Temperature Range	-40°F to +167°F (-40°C to +75°C)	
Relative Humidity (non-condensing)	0-95%	
Operating Altitude	9,842.5 ft (3,000 m)	
Communications		
Advanced Graphical User Interface	WiFi	
Communication Interface	RJ-45 Ethernet	
Third-Party Monitoring Protocol	Sunspec Modbus TCP/IP	
Web-Based Monitoring	Optional	
Revenue Grade Metering	Optional	
Firmware Updates	Remote/Local	
Testing & Certifications		
Safety Listings & Certifications	UL 1741/IEEE 1547, UL 1699B, UL 1998, FCC part 15B	
Testing Agency	ETL	
Warranty		
Standard	10 year	
Optional	15 or 20 year; Extended Service Agreement	
Enclosure		
dBA (Decibel) Rating	55 dBA @ 1 m	
DC Disconnect (Integrated)	Standard	
Mounting Angle	5-90°	
Dimensions (H x W x D)	45.8 in. x 28.3 in. x 11.6 in. (1163 x 719 x 295 mm)	
Weight	Inverter: 117 lbs (53.07 kg); Wiring Box: 49 lbs (22.22 kg)	
Enclosure Rating	Type 4	
Enclosure Finish	Polyester Powder Coated Aluminum	

SOLECTRIA SOLAR

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Email: inverters@solectria.com

DOCR-070604-F | January 2018

YASKAWA

www.jinkosolar.com

Jinko Solar
Building Your Trust in Solar

Eagle HC 72-V
340-360 Watt

MONO CRYSTALLINE MODULE

Positive power tolerance of 0~+3%

KEY FEATURES

Innovative Solar Cells
Five busbar mono half cell technology

High Efficiency
Higher module conversion efficiency (up to 18.26%) due to lower resistance characteristics

High Voltage
UL and IEC 1500V certified; lowers BOS costs and yields better LCOE

PID-Free
World's 1st PID-Free module

Low-Light Performance
Advanced glass technology improves light absorption and retention

Strength and Durability
Certified for high snow (5400 Pa) and wind (2400 Pa) loads

- ISO9001:2008 Quality Standards
- ISO14001:2004 Environmental Standards
- OHSAS18001 Occupational Health & Safety Standards
- IEC61215, IEC61730 certified products

Nomenclature:

JKM360M-72H-V

Code	Cell
null	Full
H	Half

c UL us LISTED

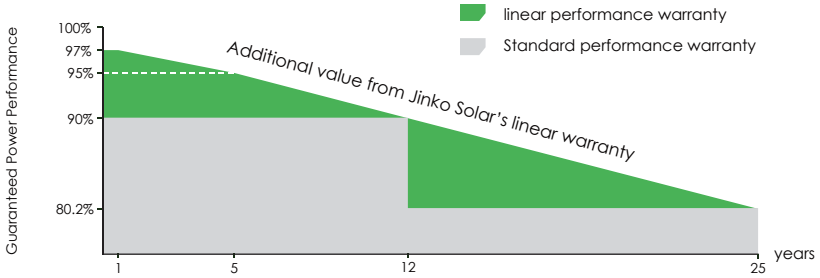
IEC

TÜVRheinland CERTIFIED

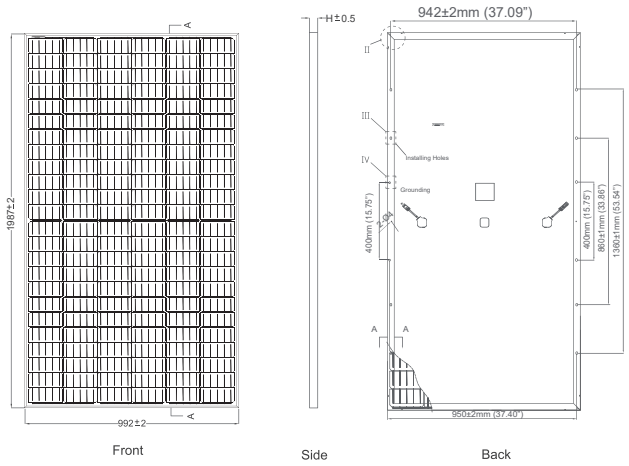
CE

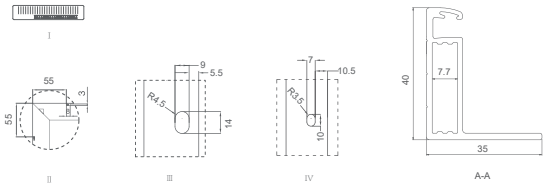
LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty



Engineering Drawings



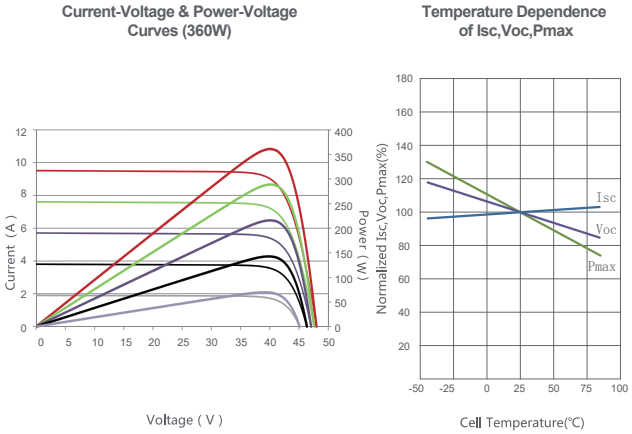


Packaging Configuration

(Two pallets =One stack)

26pcs/pallet , 52pcs/stack, 572 pcs/40'HQ Container

Electrical Performance & Temperature Dependence



Mechanical Characteristics

Cell Type	Mono-crystalline 156×156mm (6 inch)
No.of Half-cells	144 (12×12)
Dimensions	1987×992×40mm (78.23×39.05×1.57 inch)
Weight	26.5 kg (58.4 lbs)
Front Glass	4.0mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP67 Rated
Output Cables	anode 1400mm, cathode 1400mm

SPECIFICATIONS

Module Type	JKM340M-72H-V		JKM345M-72H-V		JKM350M-72H-V		JKM355M-72H-V		JKM360M-72H-V	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax)	340Wp	255Wp	345Wp	259Wp	350Wp	263Wp	355Wp	267Wp	360Wp	271Wp
Maximum Power Voltage (Vmp)	38.8V	37.1V	39.1V	37.3V	39.3V	37.5V	39.5V	37.7V	39.7V	37.9V
Maximum Power Current (Imp)	8.74A	6.87A	8.83A	6.93A	8.91A	7.00A	8.99A	7.07A	9.07A	7.14A
Open-circuit Voltage (Voc)	47.5V	45.6V	47.7V	45.9V	47.9V	46.2V	48.1V	46.5V	48.3V	46.8V
Short-circuit Current (Isc)	8.93A	7.07A	9.03A	7.13A	9.13A	7.19A	9.23A	7.25A	9.33A	7.31A
Module Efficiency STC (%)	17.25%		17.50%		17.76%		18.01%		18.26%	
Operating Temperature(℃)	-40℃~+85℃									
Maximum system voltage	1500VDC(UL)/1500VDC(IEC)									
Maximum series fuse rating	20A									
Power tolerance	0~+3%									
Temperature coefficients of Pmax	-0.37%/℃									
Temperature coefficients of Voc	-0.29%/℃									
Temperature coefficients of Isc	0.048%/℃									
Nominal operating cell temperature (NOCT)	45±2℃									

STC: Irradiance 1000W/m² Cell Temperature 25°C AM=1.5

NOCT: Irradiance 800W/m² Ambient Temperature 20°C AM=1.5 Wind Speed 1m/s

* Power measurement tolerance: ± 3%