

**Project Narrative
Knowlton Farms Solar Development
43 Estabrook Avenue, Grafton, Massachusetts
August 22, 2018**

Estabrook Valley, LLC. (Estabrook Valley) has executed a lease option with Knowlton Farm Nominee Trust, Patricia Knowlton Trustee, to develop a fourth solar energy facility (hereinafter referred to as "Grafton 4") on farmland at 43 Estabrook Avenue in Grafton Massachusetts. Estabrook Valley proposes to construct a ground-mounted solar energy facility that will produce up to approximately 331 kilowatts DC (kWDC) of power, and 250 kilowatts AC (kWAC) of power. Estabrook Valley proposes to do so by way of an elevated canopy that will allow agricultural activities – namely food crop cultivation – to continue unimpeded under the array (i.e. "dual-use"). Estabrook Valley submits this Application for a Special Permit and Site Plan Approval for the Grafton 4 solar energy facility at Knowlton Farm. The following sections describe the facility, how it will be constructed, how potential impacts will be addressed, and the benefits to the community.

The Solar Energy Facility

The facility will be comprised of approximately 840 395-watt solar panels to produce electricity. Approximately eight (8), thirty (30) kW inverters and one (1) 300 kVA pad-mounted transformer station is required to step the power up to the required Medium Voltage. Electrical infrastructure will transmit the power and interconnect it to the existing three-phase power system at 43 Estabrook Road. The solar panels will be held in place by a racking system elevated above the ground by posts driven into the subsurface. In the case of the proposed dual-use design, the low end of the panels will be high enough to accommodate the landowner's tractor and equipment – approximately 8-12 feet depending on the final design. There will be eleven (11) rows of panels of differing lengths and numbers of panels as necessary to accommodate the particular characteristics of the site. The electrical cabling system in the solar array on-site will be buried for fifteen (15) feet and then transition to poles. At the southern portion of the site, there will be a meter and disconnect and other important control systems. It is the responsibility of National Grid, the utility serving the area, to do the interconnection work and the Medium Voltage work within the public rights of way. On May 4, 2018, Estabrook Valley submitted an interconnection application, which is currently proceeding under expedited review via National Grid.

The project will utilize high quality equipment, selected for its safety, durability, and the manufacturers' ability to offer substantial product warranties. We currently contemplate that the solar panels will be high-efficiency panels manufactured by LG; the inverters by SMA, and the racks by RBI Solar. In each instance, we may elect to replace the equipment with equipment of equal quality dependent on market conditions and availability at the time of construction; however the mechanics and functionality of the system as described herein will be unchanged.

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EXHIBIT 18

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Access and Security

Access to Grafton 4 will be afforded as follows: directly from the northern side of Estabrook Avenue running along the existing fifteen (15) foot wide gravel access drive to a twenty (20) foot wide gravel driveway on the south side of the solar array. The access drive provides for easier access for tractors and equipment, as well as a turnaround. The solar energy facility will be secured from unauthorized access with a 7-foot tall perimeter chain link fence, a twenty-four (24) foot wide control gate located at the southwest corner of the facility, and three (3) 10-foot wide gates throughout the facility boundary. A Knox box will be located at the main gate and municipal emergency personnel will have access have key access to the box for entry to the facility as necessary. Signs will be placed at the gate as well as around the fence perimeter to make it clear that unauthorized access to the facility is prohibited.

Drainage

The drainage system has been designed to capture any expected increase in runoff resulting from the clearing of existing trees and the construction of concrete equipment pads and gravel access drive. No sedimentation basins are proposed for the project, which is expected to be outfitted with a water catchment system that will concentrate rainwater for agricultural use in structures placed throughout the array. The general drainage pattern of the locus area will be unchanged with water flowing from north to south toward the bordering vegetative wetland resource areas located to the north of Estabrook Avenue.

A drainage system consisting of a gravel infiltration trench has been designed and incorporated into the existing topography in order to manage stormwater runoff in an appropriate and responsible manner. More specifically, peak rates and volumes of stormwater runoff in the proposed conditions will not result in an increase in the 2, 10, and 100-year storm events at the selected design points.

Construction Sequence

The construction activities are closely sequenced for cost efficiency and environmental protection purposes.

The first step will be to stake out the limit of work in accordance with municipal permits to ensure that contractors can clearly see the extent of the work area and where work is prohibited. This will include providing sediment and erosion control measures in association with the clear limit of work demarcation. Before any site clearing can commence, a construction access tracking pad will be built at the construction site access location: from Estabrook Avenue to the location of the solar facility which will be both the long term and the construction access.

The second step is to clear the forested sections of the site. This will involve removal of all vegetation, stumping/grubbing and grading the land, and providing stabilization initially with woodchips as well as seeding for long-term erosion control.

The third step will be to build the drainage facility, the gravel infiltration trench along the southern side of the proposed gravel access drive. Once the stormwater management system has been installed, the proposed gravel access drive shall be constructed.

This work will be followed by construction of the solar energy facility including the solar panels, racking system, and associated electrical infrastructure. In the case of the dual-use design, the land will be tilled in strategic locations after the installation of racking poles and before the installation of the rest of the racking infrastructure, including modules, as per recommendations from the Natural Resource Conservation Service (NRCS) to allow for adequate land preparation for agricultural activities. The electrical system and the utility owned poles to the interconnection point at 43 Estabrook Avenue will be constructed in parallel by National Grid as it will own and operate these facilities as part of its overall electrical utility system. The proposed perimeter fencing shall be installed along with the associated gates.

Operations and Maintenance

It will be essential to all parties that the solar energy facility functions at its fullest potential. It will be equipped with a SCADA system so that its performance can be monitored remotely 24/7. Should there be any irregularities with the system's performance, technicians can respond quickly to trouble-shoot the problem and make the necessary corrections. National Grid will hold an access easement in the central portion of the site to allow it to maintain its electricity facilities on the grid side of the project electrical meter.

Generally, the solar panels are self-cleaning. The panels are angled toward the sun and each time it rains or snows the precipitation that contacts the panel flows down its face removing any dust or dirt that may have accumulated on the panels since the previous rain event. The inverters are maintained on a semi-annual basis and as needed under a performance contract with the inverter manufacturer to ensure that it is operating at peak functionality. In the case of the dual-use design, the solar panels will be elevated high enough above an actively farmed site that will incorporate such practices as periodic tilling, plantings, and harvest. At certain times, the landowner may elect to install temporary paddocks in certain locations to accommodate the cultivation of specific agricultural products, as well as vertical growing structures that hang from portions of the front and back sides of the array.

Decommissioning/Restoration

The solar energy facility will have an estimated useful lifetime of approximately 30 years or more, subject to equipment replacement and repowering. The agreement between the developer and landowner currently contemplates a twenty-year (20) primary term with two five-year (5) extension option periods. The facility will consist of numerous recyclable materials, including glass, semiconductor material, steel, wood, aluminum, copper, and plastics. When the facility reaches the end of its operational life, the component parts can be dismantled and recycled. The various components of the system will be dismantled and removed using minimal impact conventional construction equipment and recycled or disposed of safely.

Typical activities during the solar energy facility decommissioning and site reclamation phase include facility removal, breaking up of concrete pads and foundations, removal of access drives that are not maintained for other uses and re-contouring the surface where appropriate. Estabrook Valley will contract with the property owner to ensure proper decommissioning with adequate surety.

Potential for Glare

Some people ask if solar panels will produce glare. The first part of the answer is that the purpose of the solar photovoltaic module is to maximize the amount of sunlight captured to produce electricity and the industry has put considerable amount of effort into minimizing loss of sunlight and the resulting reflections. According to a study by Sandia National Labs, the reflectivity of solar panels is typically kept to around 2% of sunlight – or in other words, on par with a body of water.¹ The second part of the answer is that in most cases, people are not in a position where they can see glare from a solar project. That is because the sunlight reflection is cast skyward.

Need for Screening

Neighbors who live in sight of a proposed solar project often request that the proponent include some landscaping as part of the project to mitigate visual impacts of the project. While that point of reasoning may make sense in certain situations, it is not applicable for this project for two central reasons. First, the size of the project is small in comparison to the existing arrays on the property that were not mandated to install screening. Second, installing screening would create shade impacts that will defeat the programmatic purpose of the project (i.e. to host crop trials and yield studies both under and away from the array in conjunction with the University of Massachusetts Amherst School of Agriculture).

Project Benefits

The following are some of the benefits of the project.

- The 332 kWDC project will generate approximately 415,000 kilowatt-hours (“kWh”) in its first year of operation, and over 8.3 million kWh over its expected twenty-year life. The typical Massachusetts home uses 633 kWh per month, and this project will generate enough energy to power approximately 54 homes.
- The project is proposed to be a community solar array, whereby residents, businesses, and government entities in the greater Grafton area will have the opportunity to purchase energy from the facility and realize savings on their electricity bills.
- The array will generate lease revenue that will support the continued expansion of Knowlton Farms.
- In the case of the dual-use design, the array will directly contribute to the creation and preservation of new farmland and will be among the first commercial-scale dual-use solar farms in the country.
- The project will provide new tax revenue to the town with minimal demand on town services resulting in a net financial gain for the town budget. Because the current parcel of land is enrolled in the Chapter 61A Program which protects the sustainability of farmland, and because the proposed project is dual-use the Chapter 61A program may still apply.
- In addition to generating energy, the project will also qualify for federal tax benefits. The project will be financed using a combination of development equity and tax-equity, which is normal for projects of this nature.
- The project will produce clean renewable energy the carbon offset of which is equivalent to approximately 218 acres of forestland.

¹ ACRP Synthesis 28, “Investigating Safety Impacts of Energy Technologies on Airports and Aviation”