

**ASTGU ANNUAL REPORT**

**PURPOSE**

This Annual Report form is required to be completed and submitted annually for all projects with the MA Department of Energy Resources (DOER) which received qualification as an Agricultural Solar Tariff Generation Unit (ASTGU) under the SMART program. The form is provided to demonstrate conformance with the general provisions required for ASTGUs in 225 CMR 20.00; in particular pertaining to Section 20.06(1)(d) therein as well as associated ASTGU Guidelines; and specifically pertaining to annual reporting requirements.

The completed form will be reviewed by DOER and the MA Department of Agricultural Resources (MDAR) to determine that the farm is in conformance with all ASTGU provisions in general under the SMART Program, although more specifically to the annual production requirements.

**BASIC FARM INFORMATION**

Farm Contact Person Name: Rich Bonanno (vegetable farmer); Tyler Kimball (livestock farmer)  Farm Owner  Farm Operator

Farm Name: A. Richard Bonanno dba Pleasant Valley Gardens; Kimball Farm Feed II, Inc.

Legal Structure:  Sole Proprietor  LLC  Corporation  
 Partnership  Other \_\_\_\_\_

Mailing Address: 255 Merrimack St, Methuen, MA 01844; 791 E Broadway, Haverhill, MA 01830

Street Address (if different): N/A

Contact Phone: Available upon request Contact E-mail: Available upon request

Check all that apply:  Solar facility owner  Landowner  Applicant

Current Type of ASTGU Farm Operation (Check all that apply):

Vegetables  Fruit  Livestock  Poultry  Hay  
 Nursery  Other \_\_\_\_\_

Total Acreage in ASTGU Farm Production: 4.4 (2.5 underneath the array) acres of vegetables and 9.6 (7.5 underneath the array) acres of pasture

Gross Annual Revenue for ASTGU Farm Production: Total \$s N/A

Are any major modifications to the farm business expected in the next 5 years?  Yes  No  
(Check all that apply.)

Business Legal Structure  Operation Type  Expansion  Diversification  
 Retirement  Sale  Subdivision  Other \_\_\_\_\_

**BASIC SOLAR PROJECT INFORMATION**

Solar System Company Owner: BWC Camp Brook, LLC

Solar System Company Address: 116 Huntington Ave, Suite 601, Boston, MA 02116

Solar Company Contact Person/email/tel#: Tatiana Prevalla, [assetmgmtteam@bluewave.energy](mailto:assetmgmtteam@bluewave.energy), 617-256-2120

**ASTGU Project Start-Up/History Information:**

Date ASTGU Approved by DOER: Pre-Determination Application Approval: 13 January 2022

Date Solar Portion of ASTGU Project Commenced Construction: Notice to Proceed: 24 March 2023; Construction Start (Mobilization): 29 May 2023

Date Solar Portion of ASTGU Project was Completed & Operational: Permission to Operate: 28 February 2024; Incentive Start Date: 27 March 2024; Substantial Completion: May 10, 2024; Final Completion: February 28, 2025

Date Original Agricultural Portion of the ASTGU Project Commenced: Spring 2025

Date Original Agricultural ASTGU Portion of Project Harvested/Sowed Products: N/A

How many complete years, that is both solar and agricultural production, has the ASTGU been in operation? One year

**SOLAR ARRAY DESIGN – PLEASE PROVIDE AS-BUILT SYSTEM INFORMATION**

Please provide the following information regarding the solar array design:

Nameplate capacity AC (in MW): 1.594 MW (Note: 1 MW=1000 kW)

Expected annual generation AC (MWh): 3,347.436 MWh (Note: 1 MWh=1000 kWh)

Acreage of farmland over which array is to be installed: 15 acres (fenced acreage)

System type:  Fixed  Tracking  Other \_\_\_\_\_

Height of lowest panel edge (in feet): 7 feet

Height of lowest elevated horizontal mounting (in feet): 10 feet

Type of mounting (mono poles, racking, etc.): Driven I-beam pilings with polyethylene frost sleeve

Description of materials and process to be used for ground penetration: The site was surveyed and markers were placed at each I-beam location. An excavator was then used to dig a hole around the pile location. Then, a hydraulic pile driver on tracks was used to drive the I-beams in the center of the excavated holes. Then, the frost sleeves were added to the I-beam and soil was backfilled.

Number of panels, capacity per panel, and panel spacing: 3,575 modules at 580W capacity, mounted in rows 26'-0" on center (18'-1" edge-to-edge spacing)

*If you wish to provide additional descriptive information regarding the solar array design, including any system changes since original completion, you may include this information below, or in a typed attachment labeled "Solar Array Design."*

N/A

### **AGRICULTURAL PLAN FOR DUAL-USE AREA**

Planned agricultural use, Year 1. Check all that apply.

- Vegetable, fruit, grains, for human consumption
- Hay
- Livestock production
- Poultry production
- Horticulture
- Floriculture
- Aquaculture
- Other, please describe: \_\_\_\_\_

Please fill the Crop Table results following this section for horticulture, flowers, vegetable, fruit, grain, and hay crops for your present year of operation. Fill out one Crop Narrative for each crop, detailing anticipated crop management (planting, irrigation, soil amendments, harvesting) and equipment to be used. **Crop Table – Current Season** follows this section. Also, please also fill out a **Crop Table – Next Season** and corresponding narrative at the end of this section with your best information available.

Please fill out the Grazing Table results following this section for livestock and poultry production for your present year of operation. Please also fill out the Grazing Narrative, detailing anticipated pasture and animal management and equipment to be used. **Grazing Table – Current Season** follows the Crop Table section. Also please fill out a **Grazing Table – Next Season** and corresponding narrative at the end of this section with your best information available.

### **Additional comments regarding agricultural production for Year 1:**

How did the Agricultural Production perform versus expectations? Please explain why/why not if you can:

The agricultural production on the arrays occurred as anticipated in that no production was predicted due to the need for continued work on agricultural infrastructure, equipment procurement, and soil health.

Vegetable array: the agricultural production did not occur as expected due to equipment constraints and timing. BlueWave procured a tractor without a cab in order to accommodate the farming activities under the panels, however the tractor was not delivered until after the planting window for pumpkins and squash. Additionally, the well pump installer was delayed, and Pleasant Valley Gardens did not plant as anticipated for risk of losing the crop. It was decided to

leave the cover crop in place for the year while crop plans, irrigation layout, and infrastructure were installed during 2025.

Livestock array: The soil needed more attention than anticipated, including amendment applications, de-rocking, weeding, and cover cropping. These amendments were added in the fall to support the perennial pasture. Additionally, Tyler Kimball of Kimball Farms, was onboarded and became engaged with soil improvement activities during the fall of this season and will be grazing the site in 2026.

Did you plant the crops/graze the animals as you originally intended when your Pre-Determination Application was approved? If not please explain.

The cover crop in the vegetable array was maintained while agricultural equipment and infrastructure were being procured and/or installed at the site. The livestock array was left fallow in a forage crop and continues to be amended with lime and composted manure to support soil health and forage density in preparation for grazing in 2026. Ultimately, the soil recovery on-site will now ensure long term viability of the land for many years to come.

Were the products marketable as anticipated? Please explain how the production values (weight/bushels etc.) were determined.

The main “product” this year was soil health and improving site conditions. Retaining the cover crop, building organic matter and fostering biological activity occurred. This ultimately increases the site’s resiliency to changing weather patterns including drought conditions that are happening more frequently as experienced within this past growing season. It is anticipated that the first commercially viable vegetable crop will be harvested in 2026 as well as grazing under the livestock array.

What occurred during the current season that wasn’t anticipated? Positive & Negative.

Pleasant Valley Gardens is excited about the 2026 growing season. It was not anticipated that equipment procurement process would take as long as it did, which affected the feasibility of vegetable growing this season. The relatively low water yield of the well for the vegetable array, which was also supposed to supply the livestock array, is requiring the installation of a second well.

What Changes/Modifications do you expect to make to improve on production if needed?

The soil in the livestock array will continue to be amended with lime and organic matter. The livestock array will also be reseeded one or more times to establish a full forage stand capable of grazing cattle in 2026.

Do you expect to grow the same crops on the land in years 2 and 3? Briefly describe your crop rotation plan and what you expect to be growing on the land for the next 5 years Will the same

equipment be used? If not, is current array design compatible with future crop management needs and equipment?

For the vegetable array, it is expected that pumpkins and squash will be grown in 2026 and 2027. Depending upon the production observations and soil conditions, Pleasant Valley Gardens may plant other vegetables such as peppers, tomatoes, and eggplants in addition to the pumpkins/squash.

The livestock array will continue to produce forage for beef cattle in 2027. Based upon soil and forage conditions in 2028, there is potential to incorporate sheep and chickens into the rotational grazing plan for the cattle. Cattle herd size may increase in calendar years 2028 to 2030, depending on the forage crop quality.

All necessary equipment for both the vegetable and livestock production is compatible with the array design.

<b>Table A: Crop Production – Current Season</b>					
<b>Crop</b>	<b>Area planted (Row length and width or acreage, as appropriate)</b>	<b>Planting date(s) (approximate)</b>	<b>Harvest date(s) (approximate)</b>	<b>Expected productivity, total pounds harvested with dual use</b>	<b>Actual productivity, pounds, with dual use</b>
Cover crop (Fuzz & Buzz seeding mix with annual ryegrass)	4.4 acres	Overseeding occurred in the spring of 2025	N/A	N/A	N/A

## **CROP NARRATIVE – Current Season**

*Please detail the crop management for this past season, including approximate **dates** and **equipment** used. The purpose of this form is to provide empirical data regarding compatible equipment usage and crop management needs. If you need additional space, please include a typed attachment labeled “Crop Narrative.”*

Crop: Cover Crop (Fuzz & Buzz seeding mix combined with annual ryegrass)

Planting Plan: The portion of the array that will have vegetables next year was a hay field prior to construction. It was re-seeded as needed during construction with Ernst Seeds Fuzz & Buzz seed mix. The vegetative cover that was growing post-construction in 2024 remained in place to serve as vegetative cover while irrigation plans and equipment procurement occurred.

Soil Amendment Plan: Based upon the soil test results showing a soil pH of 6.8, no additional lime was applied.

Cultivation Plan: Sections of the vegetable array were rototilled to determine soil condition for vegetable cropping. The cover crop was mowed with a rotary mower in September to control weeds and stimulate vegetative growth.

Irrigation Plan: No irrigation was necessary for the cover crop. An on site well was installed. A solar powered pump and water line were designed to accommodate the well’s capacity and the intended vegetable production.

Pesticide/Herbicide Plan: Neither pesticides nor herbicides were applied during 2025.

Harvest Plan: No crop harvest occurred in 2025 since cover cropping the ASTGU was prioritized.

<b>Table B: Grazing Production – Current Season</b>							
<b>Type(s) of animal grazed</b>	<b>Area grazed (acreage)</b>	<b>Grazing pressure # animals per acre</b>	<b>Purpose (e.g. meat, dairy, eggs)</b>	<b>Grazing period(s)</b>	<b>Harvest date(s) if applicable</b>	<b>Expected productivity with solar array</b>	<b>Actual productivity with solar array</b>
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

## GRAZING NARRATIVE – Current Season

*Please detail the past season animal and pasture management, including **dates** and **equipment** used. The purpose of this form is to provide empirical data regarding compatible equipment usage and production needs. If you need additional space, please include a typed attachment labeled “Grazing Narrative.”*

Type(s) of Animals Grazed: N/A

Pasture Management Plan: List any anticipated seeding, soil amendment, irrigation, pesticide, mowing, etc., including approximate dates and equipment used.

The livestock array was mowed in the early fall with a rotary mower. To improve the soil conditions, it was also weeded and de-rocked by hand and limed using a rotary spreader in the fall. Additionally, in late fall 4” of compost is being spread over the site using skid steers and it is being seeded with Winter Rye using a drill seeder.

Animal Management Plan:

For each type of animal grazed, describe management regarding housing/shelter, water source, fencing, movement, disease treatment, harvest, etc. that was carried out within the solar array area. Describe equipment used in these activities.

No livestock grazing occurred on site in 2025 due to soil remediation work. Please see next season’s 2026 grazing narrative for more detail on the anticipated animal management plan.

Describe any modifications to the solar array design that were made in order to reduce the risk of animal damage to the solar array, or risk of electrocution to animals.

The array is raised 10’ at the torque tube and DC conductors are secured along the torque tube at this height. There is no overhead CAB system on this site. Instead, where conduit travels out of the line of the array rows, wires are encased in PVC conduit and buried more than 3’ deep to reduce any risk of electrocution of animals or farmers during agricultural activities. All equipment that must be grounded is grounded and higher voltage equipment such as transformers are enclosed within a fence. The livestock portion of the array is surrounded entirely by its own 8’ tall fixed-knot woven wire fence.

<b>Table A: Crop Production – Next Season</b>					
<b>Crop</b>	<b>Area planted (Row length and width or acreage, as appropriate)</b>	<b>Planting date(s) (approximate)</b>	<b>Harvest date(s) (approximate)</b>	<b>Expected productivity, total pounds harvested without dual use</b>	<b>Expected productivity, total pounds, with dual use</b>
Pumpkins	1.6 acres	Late May to mid June	September	Approximately 12,000 lbs	8,000 lbs
Butternut Squash	1.6 acres	Late May to mid June	Late September to the end of October	Approximately 14,000 lbs	10,000 lbs
Winter Squash (including Acorn)	0.8 acres	Late May to mid June	Late September to the end of October	Approximately 7,000 lbs	5,000 lbs

## **CROP NARRATIVE – Next Season**

*Please detail the crop management planned for next season, including approximate **dates** and **equipment** used. The purpose of this form is to provide planned data for the upcoming season regarding compatible equipment usage and crop management needs. If you need additional space, please include a typed attachment labeled “Crop Narrative.”*

Crop: Pumpkins and squash

Planting Plan: Pumpkins, butternut squash, and winter squash (such as acorn squash) will be planted in late May to mid-June after the last frost. The anticipated planting plan is to divide the vegetable array into ±1.6 acres of pumpkins, ±1.6 acres of butternut squash and ±0.8 acres of winter squash. Three raised plastic beds will be laid in each area between solar panel rows using a plastic mulch layer with a bed shaper. Holes will be punched into raised plastic beds every three feet, and two seeds will be seeded into each hole by hand. Once germinated and showing their first true leaves, some plants may be thinned down to one plant per hole.

Soil Amendment Plan: The soil will be amended with 15-4-12 fertilizer shortly before planting at a rate of 650 lbs/acre. No other fertilizer should be necessary unless it is a particularly wet year, in which case calcium nitrate (15.5-0-0) could be applied at a rate of 250 lbs/acre. No liming of the area is expected since the soil pH is currently 6.8.

Cultivation Plan: The planting areas between the panel rows will be mowed then sprayed with Roundup to terminate the current vegetative cover in April 2026. In May 2026, the planting areas will be tilled likely using a tractor with a rototiller attachment.

Irrigation Plan: A well was installed on site for crop irrigation. Drip tape will be installed while raised plastic beds are laid. The frequency and duration of irrigation events will depend on the growth stage of the pumpkins and squash as well as the weather.

Pesticide/Herbicide Plan: Pest and disease management will follow IPM practices and applications of pesticides will be made based on scouting observations in the field made by an IPM specialist. The application of pesticides will follow UMass Extension, the New England Vegetable Management Guide and product label recommendations.

Harvest Plan: Squash and pumpkin harvesting are done by clipping the fruit from the stems and collecting them into large bins. Harvesting of the pumpkins and butternut squash will occur between the middle of September and the end of October.

Table B: Grazing Production – Next Season							
Type(s) of animal grazed	Area grazed (acreage)	Grazing pressure # animals per acre	Purpose (e.g. meat, dairy, eggs)	Grazing period(s)	Harvest date(s) if applicable	Expected productivity without solar array	Expected productivity with solar array
Cattle	7.5 acres	6 cows total (~0.8 cows per acre)	Grass-fed meat	2-3 times within the growing season	Weight gain measurements taken upon each grazing period	+/- 800 lbs of herd weight gain per season	+/- 800 lbs of herd weight gain per season

## GRAZING NARRATIVE – Next Season

*Please detail the next season animal and pasture management, including **dates** and **equipment** used. The purpose of this form is to provide planned data for the upcoming season regarding compatible equipment usage and production needs. If you need additional space, please include a typed attachment labeled “Grazing Narrative.”*

Type(s) of Animals Grazed: Cattle

Pasture Management Plan: List any anticipated seeding, soil amendment, irrigation, pesticide, mowing, etc., including approximate dates and equipment used.

A secondary liming of the pasture will take place in early Spring using a rotary spreader. Reseeding of the livestock array with an alfalfa, orchardgrass, clover and oats mix using a drill seeder will occur in early spring 2026. Weed management of the livestock array is expected to continue throughout the growing season using hand weeding and potentially herbicide applications. No irrigation of the forage crop in the livestock array is planned.

Animal Management Plan:

For each type of animal grazed, describe management regarding housing/shelter, water source, fencing, movement, disease treatment, harvest, etc. that was carried out within the solar array area. Describe equipment used in these activities.

The protection from the trees surrounding the site and the panels themselves serve as an adequate natural shelter for the cattle. The plan is to flash graze 10 cattle for the spring flush of the forage crop then rotate 6 heifers through the summer season. The array area will be divided into three grazing sections using movable temporary electric fencing for proper vegetative management. Electric livestock fencing will be installed to reenforce the existing livestock fencing. A well will serve as the water supply for the livestock array. As a secondary water supply, Kimball Farms has a water truck that can be brought on site if necessary. A licensed vet will be engaged as needed. Due to the variable number, breed and maturation stage of the cattle that may graze the site, the intended metric for determining success of grazing the site is weight in and weight out at each grazing interval. It is not anticipated that there will be any difference in weight gain between the animals grazing under the panels compared to grazing in an open field.

Describe any modifications to the solar array design that were made in order to reduce the risk of animal damage to the solar array, or risk of electrocution to animals.

No additional modifications are anticipated at this time.

## **Waiver for Decreased Yield**

### **i. Waiver for Decreased Yield**

Due to unforeseen circumstances, such as but not limited to weather events, pests, or change in crops, the projected agricultural yield for any given year may be lower than stated in the agricultural plan or previous year's annual report. In these instances, an applicant can request a waiver to the Department for the decreased yields. The applicant must demonstrate to the satisfaction of the Department, and in consultation with MDAR, that a waiver is warranted for good cause. Waiver requests must be submitted by November 1st of the applicable calendar year and sent to [DOER.SMART@mass.gov](mailto:DOER.SMART@mass.gov).

### **ii. Failure to Report**

If the ASTGU fails to submit an annual report, the Department may declare the project ineligible for the ASTGU adder for one year. If the annual report is not completed for a second year, then the Department may permanently disqualify the ASTGU from continuing to receive the ASTGU Adder for the remainder of the STGU's tariff term.

## SIGNATURES AND ATTESTATIONS

Prior to submitting the Pre-Determination Form, please read and sign as directed below.

### Landowner

I hereby certify that I have personally examined and am familiar with the information submitted herein, and, based upon my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete.

Rose Jackson  
Rose Jackson (Nov 25, 2025 22:26:51 EST)

Signature of Landowner

11/25/25

Date

### Farm Operator and Landowner

I/we hereby certify that the information submitted regarding the current farm conditions and practice and the Agricultural Plan for the Dual-Use Area is accurate and complete to the best of my/our knowledge and intentions, and that I/we have engaged with the University of Massachusetts Amherst Clean Energy Extension and thereby its agricultural extension service to review the Agricultural Plan and its compatibility with the solar array structures and shading. Further, I/we agree, conditional on being provided eligibility to the SMART program as an ASTGU, to submit a report, through a template provided by the University of Massachusetts Clean Energy Extension, annually throughout the duration of the SMART incentive with ASTGU adder, on the operations and productiveness of the solar array and agriculture along with any changes to the Agricultural Plan for the following year. I/we understand that failure to maintain productive agricultural activities and annual reporting may result in the disqualification of the facility as an ASTGU in the SMART program.

Richard Bonanno  
Signature of Farm Operator

11/25/2025  
Date

[Signature]  
Signature of Farm Operator

11/25/25  
Date

Rose Jackson  
Rose Jackson (Nov 25, 2025 22:26:51 EST)

Signature of Landowner

11/25/25

Date

Solar Facility Owner

I hereby certify that the information submitted regarding the Solar Array Description and inputs and outputs of the Shading Analysis is accurate and complete to the best of my/our knowledge and intentions.



Deborah Collum  
Authorized Signatory  
Signature of Solar Facility Owner

Date: December 1, 2025