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Holliston Planning Board
703 Washington Street
Holliston, MA 01746

Subject: 600 Central St Proposed BESS Project – Additional Information and Responses

Dear Members of the Planning Board:

BWC Bogastow Brook, LLC would like to submit the following responses to comments and concerns raised at the 10/13/2022 Planning Board meeting regarding the Special Permit application for the proposed Battery Energy Storage System at 600 Central St. Comments have been summarized based on meeting notes from the public hearing, and BlueWave can address any additional concerns or questions the Board or public may have at the continued public hearing.

Question/Concern #1: What is the distance to the closest residents to the battery equipment?

BW Response: The nearest resident to the battery energy storage system is a minimum of 150' away from the proposed battery equipment. NFPA 855 guidelines recommend a 100' property line and building setback for stationary energy storage systems, which is being observed with the project location.

Question/Concern #2: What grading is being done to the site?

BW Response: The planset submitted with the Special Permit application shows the areas where grading is occurring and the proposed contours. The majority of major grading will take place within and adjacent to the fenced-in system, as the area where the batteries are located has a maximum slope

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tolerance of approximately 1-2% grade. Adjacent to the fenced-in area there will be additional slope grading to meet the thresholds established by the Town Zoning Bylaws, and for stormwater management features. Additionally, the access road will required grading along its length to provide an acceptable slope for construction and operation, as well as for stormwater management features. The route of the access road was chosen to reduce the amount of grading required as much as possible.

Question/Concern #3: Why is the project being proposed in a residential area?

BW Response: Because of the use case of standalone energy storage and the function of the technology, energy storage systems provide greater value in areas of denser development where there is greater load on the electric grid. Siting projects in developed areas brings added resiliency to the electric grid, reducing the probability of blackouts, enabling further electrification of homes and transportation and decarbonization of the grid.

Question/Concern #4: What is the useful life of the batteries and what happens to them when they are spent?

BW Response: The expected operational life for the battery units is 20 years, assuming the batteries are cycled on average once per day, which is the intended operational profile for this project. Prior to issuance of a building permit, a decommissioning plan for the approved project design would be submitted to the Town, along with a decommissioning cost estimate for review. BlueWave would post a decommissioning surety bond in the amount of the approved decommissioning cost estimate that could be called upon by either the Town or the Church. All equipment and site components (concrete, wiring, etc.) would be dismantled and removed from the site and taken to appropriate recycling or disposal facilities. Battery cells would be removed, transported, and recycled or otherwise disposed of per MassDEP Hazardous Waste regulations.

BlueWave intends to transport all spent battery cell units to appropriate recycling facilities, ideally locally or regionally located, such as the ERI e-waste recycling facility located in Holliston. The following information from the EPA describes the general process for battery cell recycling.

<https://www.epa.gov/recycle/used-lithium-ion-batteries#:~:text=Li%2Dion%20batteries%20in%20electronics,collection%20program%20for%20more%20Options>.

Additionally, due to the expected volume of energy storage facilities going into operation, there are multiple advanced recycling facilities currently under development worldwide. One such example is the company Nth Cycle based out of Beverly, Massachusetts, which is utilizing a proprietary method for battery recycling and intends to ramp up operations moving forward in the future. Their method for recycling is further detailed on their website found here:

<https://nthcycle.com/technology/how-it-works/>

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Question/Concern #5: Does the operating profile for the battery system change for summer versus winter?

BW Response: Seasonality can affect the specific hours during which the battery system charges and discharges, primarily based upon power prices during specific seasons and when the most generation is occurring on the grid. Under the Clean Peak program under which the system will operate, the specific charging windows differ slightly depending on the season as detailed on a preliminary basis below:

	<i>Energy Storage Charging Windows</i>	
<i>Clean Peak Season</i>	<i>Wind-Based Charging Hours</i>	<i>Solar-Based Charging Hours</i>
<i>Spring</i>	<i>12am - 6am</i>	<i>8am - 4pm</i>
<i>Summer</i>	<i>12am - 6am</i>	<i>7am - 2pm</i>
<i>Fall</i>	<i>12am - 6am</i>	<i>9am - 3pm</i>
<i>Winter</i>	<i>12am - 6am</i>	<i>10am - 3pm</i>

On the whole, the operational profile of the system is not expected to change drastically depending on the season.

Question/Concern #6: Does the system generate noise? Can a sound study be conducted to assess noise impact and any mitigation required?

BW Response: Daytime and Nighttime ambient noise levels were monitored over a 7-day period at the proposed project site. The final results of the sound modeling and analysis are currently underway, and BlueWave shall provide the results of the analysis signed by the qualified third-party expert conducting the study. Any mitigation measures identified as necessary for the site based on the noise analysis shall be incorporated into the project design.

Question/Concern #7: What health hazards are present with the system?

BW Response: Normal and expected operation of the battery system does not present any health hazards to the general public or nearby residents. Concerns and risks regarding health and safety

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generally fall into two categories in regard to energy storage systems: fire risk, and ground contamination/spill risk.

With respect to fire risk, modern lithium-ion based battery systems have advanced significantly for fire prevention and safety, assisted by the development of updated and rigorous testing standards. For the Powin Centipede system specifically, there is a fire prevention and suppression system that has several components. Each enclosure comes equipped with a heat detector, smoke detector, and gas detector. Additionally, temperature, voltage, and current will be monitored all the way to the individual cell level 24/7 by a Remote Operations Center. If the system detects conditions outside of acceptable operating conditions, the system's E-Stop sensors will automatically trigger an immediate shutdown of the system. If the heat, smoke, or gas detectors are tripped, this will also automatically trigger a system E-Stop. Additional conditions can trigger automatic E-Stops, including the opening of enclosures during operation, or electric grid conditions outside of normal voltage and frequency ride-through levels.

In the event of a fire, the Powin Centipede system will come equipped with two fire suppression systems. Each enclosure will come equipped with a Stat-X fire aerosol-based fire suppression agent that will disperse within the unit upon fire/smoke detection. The Stat-X suppression agent is non-toxic and non-hazardous. An MSDS for the material was submitted as part of the application package. Additionally, each enclosure will come equipped with a 1.5" dry-standpipe that leads to an internally located sprinkler head. The dry-standpipe has an external FDC connection that can be used to flood each individual enclosure with water. However, in the event of a fire, the recommended course of action for first responders is to create a safety perimeter around the site and allow the affected enclosure to conduct a controlled burn. Water is to be used as a containment method, and fire fighters will spray down adjacent enclosures and the battery yard to keep temperatures in check.

Most importantly, the Powin Centipede system has been extensively tested at third-party laboratories to meet UL 9540 and 9540A certification. Test results demonstrate that the anticipated outcome in each case is that thermal runaway in an individual battery cell forced into thermal runaway does not propagate fire or thermal runaway to neighboring cells. The project location has been chosen to maintain a minimum distance of 100' setback from all property lines and structures per NFPA 855 guidance on energy storage systems.

With respect to ground contamination/spill risk: all lithium-ion battery cells are composed inherently of an anode, cathode, and electrolyte. In the case of the LFP battery cells utilized in the Powin Centipede system, this electrolyte is a viscous fluid contained within each cell. The large majority of the electrolyte will remain absorbed into the electrodes of the cell during normal operation, leaving very little free-standing fluid that could leak in the event of a cell rupture. Each cell is hermetically sealed, and all battery cells are housed within the larger NEMA rated steel enclosures. Thus, in the unlikely event of an individual or multiple cells rupturing, the enclosures would contain any amount of liquid electrolyte present from coming into contact with the exterior environment.

In the event of a fire or other emergency, once the site has been contained and deemed safe, proper MassDEP hazmat and spill response procedures will be observed and conducted on-site before opening any enclosures for inspection and repair/removal. This is to ensure that no material or fire suppression

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water runoff that comes into contact with the interior of the enclosure and any exposed battery cells can seep into the ground or cause concern or risk for ground contamination.

Question/Concern #8: What vegetation is being proposed for visual screening? Can there be vegetation along the northern stormwater basin?

BW Response: As an initial proposal, BlueWave is proposing evergreen arborvitaes to provide for year-round visual screening. Additionally, a visual screening fence is being proposed along the northern limit of work adjacent to the property boundary to ensure no visual impact to adjacent neighbors. BlueWave is open to any preferences the Board may have in regard to species of vegetation for visual screening in lieu of traditional arborvitaes.

With respect to vegetation along the basins: BlueWave has proposed vegetative screening in the areas most affected by tree-clearing to the north and northeastern property abutters. Additional vegetative plantings can be identified during construction depending on final grades and stabilization of stormwater basins.

Question/Concern #9: Please comment on the incidence of emergency events at other BlueWave developed sites, preferably in number of events per operating hours. Please identify other sites that may be in residential areas.

BW Response: To-date, there are a total of four BlueWave developed Battery Energy Storage Systems (BESSs) that have been built, all located in Massachusetts. All four sites are solar plus energy storage sites, where the battery systems are DC-coupled directly to a larger solar array. Each site utilized systems with lithium-ion battery cells; however, these systems utilized Nickel Manganese Cobalt chemistry, rather than the Lithium Iron Phosphate chemistry utilized in our proposed system. Generally, LFP battery chemistries are considered more stable and safer than NMC chemistries based on testing.

Across the sites built to-date, BlueWave is not aware of any fires or emergency events caused by the energy storage system on each site. The sites have been operational for approximately 1-2 years, an average of 13,140 operating hours, with 0 incidents observed. For each of BlueWave's four solar + BESS sites, the distances from the BESS to the nearest residence and/or building are as follows: ~275ft, ~800ft, ~315ft, and ~1,050ft. Two of the BESS systems are directly adjacent to residential neighborhoods, one is within 0.5 miles of a dense residential area, and the last site is an active farm operation. As previously mentioned, BlueWave is not aware of any complaints or concerns raised by the Town or nearby residents in regard to the BESS systems.

Based on the publicly available EPRI BESS Failure Event Database, similar sized BESS systems (5-50MWhs) that encountered fire or emergency failure events totaled 8 since 2020 worldwide. Per EPRI, there have been a total of 50 utility-scale or commercial-scale battery failures representing a 1-2%

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failure rate across the ~12.5 GWh of commercial and utility-scale lithium-ion battery energy storage systems worldwide. Additionally, BlueWave looked at battery storage projects larger than 1MW that went into operation from 2019 to today, and publicly available reports of fire/emergency incidents. From EPRI, there have been public reports of fires/failures at 9 battery projects in the United States during that time. Based on the number of operational hours across all of the observed 323 projects in the United States over that time, this corresponds to an incidence rate of 2.05 incidents per 1 million operating hours across all projects.

Question/Concern #10: What is the tax benefit to the Town of Holliston? Will BlueWave be responsible for back taxes or increased taxes going forward on the Church's property?

BW Response: BlueWave would intend to enter into a PILOT agreement with the Town to establish agreed-upon annual tax payments to the Town. The calculation of annual amounts will be discussed with the Town Assessor. Based on previous PILOTs BlueWave has entered into with other municipalities for solar and solar plus battery storage sites, the expected annual PILOT revenue to the Town is expected to be greater than or equal to \$30,000 per year, depending on final agreed-upon rates with the Assessor.

BlueWave would be responsible for and pay any real estate taxes owed to the Town in the event the project is built.

Question/Concern #11: Has BlueWave met with the Conservation Commission?

BW Response: BlueWave has submitted a Request for Determination to the Holliston Conservation Commission and has met with the Commission at several public meetings. BlueWave anticipates receiving a Negative Determination from the Commission, pending final review and confirmation of the stormwater peer review.

Question/Concern #12: Are there any impacts to endangered species or wildlife?

BW Response: The entirety of the 600 Central St property is not mapped under any listed endangered species habitat or NHESP Priority Habitat areas.

Question/Concern #13: Who is financially responsible for any issues with the project?

BW Response: BlueWave, as owner and operator, would be financially responsible for any issues that arise during construction or operation of the project. BlueWave would have a vested interest to ensure that the system is well maintained and that any potential issues or events that arise are quickly and safely addressed. Additionally, a decommissioning bond will be provided to give the Town

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and Church a financial mechanism to decommission and remove the project in the extremely unlikely event that the project were to be abandoned or removal required.

Question/Concern #14: What preparation will the fire department need? How much water would be required in the event of a fire?

BW Response: BlueWave, in coordination with the fire department, would finalize an emergency response plan that would include details on proper response procedures and coordination with BlueWave in the event of a fire or other emergency. As mentioned in a previous response, in the event of a fire, the recommended course of action is to use water as a containment/defense measure for the site and area surrounding an affected enclosure. Thus, the amount of water used on-site will vary depending on first responders' assessment of the situation and containment needed.

Question/Concern #15: Is there risk of EMF fields that could affect nearby residents?

BW Response: Various components in energy storage systems generate EMF, just as with other equipment and devices generating and transmitting electrical power. This includes the batteries, cabling, inverters, and utility lines connecting the project to the local grid. There have been studies assessing EMF from large-scale energy storage sites: most recently the proposed 250MW energy storage project in Medway assessed EMF impact to nearby residents. The conclusion of the study was that the project equipment emitted EMF at a fraction of the natural background levels already present in the environment, and that these systems do not pose adverse health risks or impacts to nearby residents or abutters.