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August 11, 2023

Melanie A. Bachman, Esq. Executive Director Connecticut Siting Council 10 Franklin Square New Britain, CT 06051

Re: Petition of Endurant Energy for a Declaratory Ruling, Pursuant to Connecticut General Statutes §4-176 and §16-50k, for the Proposed Construction, Maintenance and Operation of a 4.9-megawatt Battery Energy Storage System to be Located at 350 Knotter Drive, Cheshire, Connecticut, and Associated Electrical Interconnection

Dear Ms. Bachman:

Pursuant to Connecticut General Statues Sections 4-176 and 16-50k(a), Endurant Energy hereby submits to the Connecticut Siting Council a Petition for a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need is necessary for the construction, operation and maintenance of a 4.9-megawatt ("MW") Battery Energy Storage System including associated equipment and related site improvements located at 350 Knotter Drive, Cheshire, Connecticut.

Enclosed is a check in the amount of \$625 for the required filing fee.

Should you have any questions regarding this filing, please do not hesitate to contact me.

Very truly yours,

Bruce L. McDermott

**Enclosure** 

**Murtha Cullina LLP** 265 Church Street New Haven, CT 06510 T 203.772.7700 F 203.772.7723

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# STATE OF CONNECTICUT CONNECTICUT SITING COUNCIL

Petition of Endurant Energy for a Declaratory Ruling, Pursuant to : Petition No. \_\_\_\_

Connecticut General Statutes §4-176 and §16-50k, for the Proposed Construction, Maintenance and Operation of a 4.9-

megawatt Battery Energy Storage System to be Located at 350 Knotter Drive, Cheshire, Connecticut, and Associated Electrical

Interconnection : August 11, 2023

Petition for Declaratory Ruling of Endurant Energy



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#### I. INTRODUCTION

Pursuant to Section 16-50k and Section 4-176(a) of the Connecticut General Statutes ("CGS") and Section 16-50j-38 et seq. of the Regulations of Connecticut State Agencies ("RCSA"), Endurant Energy ("Endurant") requests that the Connecticut Siting Council ("Council") issue a Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need ("Certificate") is not required for Endurant's proposed location, construction, operation and maintenance of a 4.9-megawatt ("MW") Battery Energy Storage System ("BESS"), a 13.8kV electrical interconnection, and associated equipment (together, the "Project") at 350 Knotter Drive, Cheshire, Connecticut (the "Property").

As discussed more fully in this Petition for Declaratory Ruling (the "Petition"), the construction, operation and maintenance of the Project satisfy the statutory elements of CGS § 16-50k and will not have a substantial adverse environmental effect. Accordingly, this Petition should be approved by the Council.

#### A. ENDURANT

Endurant designs, finances, builds, constructs, owns, operates, and maintains BESS projects. Endurant is a subsidiary of LS Power, which has developed, constructed, managed and acquired more than 46,000MW of competitive power generation and over 680 miles of transmission infrastructure, for which it has raised \$50 billion in debt and equity financing. This experience includes some of the largest BESS projects in the United States.

Endurant has developed distributed energy and battery storage systems for nearly twenty years. Among its chief achievements are designing and building the first MW-scale, distribution-connected BESS projects in the nation's most dense and technically complex distribution system, New York City. Endurant did so in collaboration with the State of New York and Consolidated Edison ("Con Edison") under a pilot program, the REV Demonstration Program, which is similar to the Connecticut Energy Storage Solutions Program ("ESSP"). These first-of-their-kind projects resulted in several industry-setting milestones, including the first projects to secure "Letters of No Objection" from the New York City Fire Department, permits and allowances from the NYC Department of Buildings, and interconnection approval from Con Edison.

Endurant has executed similar projects in the State of Connecticut. These include five separate fuel cell projects for Bloom Energy and a fuel cell-based microgrid for the City of



#### Hartford.<sup>1</sup>

All correspondence and/or communications regarding this Petition should be addressed to:

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A copy of all such correspondence or communications should also be sent to Endurant's attorney:

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#### II. CONSISTENCY WITH STATE ENERGY POLICY

#### A. ENERGY STORAGE SOLUTIONS PROGRAM

In June 2021, the Connecticut General Assembly passed *Public Act No. 21-53, An Act Concerning Energy Storage*. The Act directs the CT Public Utilities Regulatory Authority ("PURA" or the "Authority"), in coordination with the Department of Energy and Environmental Protection ("CT DEEP") and the CT Green Bank ("CTGB"), to initiate a proceeding to develop and implement programs and associated funding mechanisms incentivizing electric energy storage resources. When undertaking this proceeding, the Authority was instructed to design and administer a new incentive program that accelerates the adoption of electric energy storage technologies such as battery systems. One of the principal goals of the legislation is to unlock the benefits that energy storage technologies deliver to ratepayers.

Consequently, in connection with Public Act 21-53, An Act Concerning Energy Storage, PURA issued a final decision in Docket No. 17-12-03RE03, PURA Investigation into Distribution

<sup>&</sup>lt;sup>1</sup> Endurant's Petition for a Declaratory Ruling for a 4.9-megawatt BESS, a 13.8kV electrical interconnection, and associated equipment in Meriden, Connecticut is pending before the Council (Petition 1585).



System Planning of the Electric Distribution Companies – Electric Storage, establishing a statewide energy storage program, known as the "Energy Storage Solutions Program" or "ESSP". In the Final Decision in Docket No. 17-12-03RE03, PURA explicitly created electric storage deployment targets for commercial and industrial ("C&I") energy users and established an incentive structure to promote non-residential customer participation in the ESSP.

The Project at the center of this Petition is one of the C&I projects that was selected and approved by the Authority.

#### B. CONSERVATION AND LOAD MANAGEMENT PLAN

Pursuant to CGS §§ 16-245(m) and 16-32(f), the State of Connecticut's electric and gas distribution utilities published the "2022-2024 Conservation & Load Management Plan: Connecticut's Energy Efficiency and Demand Management Plan" on May 1, 2022.

The Plan explicitly identifies energy storage projects, such as the project central to this Petition, to be a cornerstone of the Plan: "the Companies will promote the co-delivery of energy efficiency and demand management programs that support decarbonization and carbon neutrality, including ...battery storage." The Plan continues, "[t]hese active demand response strategies will significantly reduce peak demand and greenhouse gas emissions, helping to mitigate the impact that the state's building sector has on the environment and climate change. The Companies plan to encourage customers to engage with a more modern grid, improving energy affordability and resilience."

The Plan specifically references battery storage throughout the document as being a priority for the state to reach its energy goals for reducing ratepayer costs, hardening the grid's resiliency, and improving the state's environmental footprint.

#### C. CONNECTICUT SITING COUNCIL "WHITE PAPER ON THE SECURITY OF SITING ENERGY FACILITIES"

In response to Public Act 07-242, "An Act Concerning Electricity and Energy Efficiency", the Council issued its White Paper on the Security of Siting Energy Facilities to establish the Council's scope of review of energy security for electric transmission and distribution assets on October 8, 2009. Specifically, the White Paper considers the planning, preparedness, response, and recovery capabilities of transmission and distribution assets, including generation assets.

<sup>&</sup>lt;sup>2</sup> 2022-2024 Conservation and Load Management Plan: Connecticut's Energy Efficiency and Demand Management Plan ("2022-2024 C&LM Plan") at 15-16; see also, 2023 Plan Update to Connecticut's 2022-2024 Conservation & Load Management Plan, at 14.

<sup>&</sup>lt;sup>3</sup> 2022-2024 C&LM Plan at 16-17.



The "clean energy revolution" is often characterized as a transformation from a fossil-fuel based system to a renewable system. While this is correct, system planners, grid operators, and development practitioners see another more fundamental transformation of the energy system: a shift from a centralized system to a de-centralized system. Just as networked computing and telecommunications have undergone this transformation since the 1970's, the electric grid is following a similar path, trading the "hub-and-spoke" star network of Westinghouse's day, for a more "mesh network," defined by flexibility, interconnectedness, and resiliency.

The result of this transformation is clear: distributed systems and mesh networks are inherently more secure by eliminating single points of failure. Battery energy storage systems are critical components of this security in their ability to maintain the integrity of the grid's 60hz sinusoidal wave form and provide excess electric capacity in the event of a grid outage. They give grid planners flexibility when upgrading distribution systems, allow businesses (such as the site host, Accel International Holdings, LLC ("Accel") to be prepared for outage events, offer dynamic millisecond response capability to a variety of systemic needs, and, most importantly, can provide first responders time and options during emergency events. This also applies to the building process for the proposed Project.

In short, the proposed Project is part of Connecticut's evolution towards a more secure and resilient energy system.

## III. PROJECT PURPOSE

The purpose of the proposed Project is to meet the goals of the ESSP. It will do so by offering benefits to Accel, and the surrounding community through lower electricity costs, enhanced grid resiliency, and the maximization of "the long-term environmental benefits of electric storage by reducing emissions associated with fossil-based peaking generation." (ESSP Program Manual, January 20, 2023).

The BESS will be connected behind the customer's electric utility meter, which will allow the facility to run on battery power during peak demand times, alleviating grid congestion. That is, the BESS will be used for demand response and demand management to lower the site host's electric bills, and to allow for load shifting that enables the customer to use less expensive off-peak power during the daytime peak hours. The energy market's natural time-of-use pricing difference means the battery will charge throughout the night.

As required by the ESSP guidelines, the BESS will operate in parallel with the grid, and can also export power into the utility distribution system, delivering valuable "peaking power"



during peak demand times when excess supply is most needed to balance the network. As energy markets mature, the BESS will be able to provide additional ancillary services to the grid, increasing its value to all ratepayers over its 10-year life.

## IV. PROJECT BENEFITS

The Project is an enabling technology for the grid's transition to renewable energy. The BESS will charge from the grid at night when electricity prices are lower. The BESS will return that electricity to the grid when electricity prices are high, the sun is not shining, the wind is not blowing, or peak electric demand necessitates a reliance on carbon-intensive fossil fuel generation sources (coal or natural gas based "peaker plants").

At a micro-level, this "peak-management-focused" operational approach will take stress off of the neighborhood's local distribution grid when it is most vulnerable to pricing spikes that increase costs, balance the system when it is most vulnerable to instabilities to help reduce the frequency of outages, and relieve stress on the local network's infrastructure that can help the utility defer or delay expensive system upgrades. Put simply, the Project will be an elemental part of a larger strategy to reduce costs, disturbances, and improve the reliability of energy for the community's businesses and residents.

The Project will be one of the first critical assets to participate in the ESSP and, as part of that program's target for a large, distributed portfolio, the Project will deliver the following benefits recognized by the Authority in Docket No. 17-12-03RE03:

(1) **Economic Benefits:** The Project will allow the host site, Accel International, to realize lower net energy costs through the battery's demand management, capacity charge management, time-of-use energy shifting, and revenue share operations.

As described above, the Project will be an integral part of the ESSP's economic goals of lowering the grid's peak demand, lowering ratepayer costs by relieving peak grid capacity and transmission charges, adding capacity during times that it is needed, thereby, allowing electric utilities to avoid or delay expensive distribution infrastructure upgrade costs, increasing business operation "uptimes" through avoided outages and grid instability induced facility disruptions, enabling the integration of cheaper renewable energy resources like solar PV, and avoiding the healthcare and economic productivity costs associated with higher polluting power generation resources.



- (2) Resiliency Benefits: For the host site, the Project will provide fast-acting backup power during utility grid outages for up to several hours, allowing Accel to maintain operations during shorter outages and avoiding grid-transients and harmonic distortions that may cause the facility's industrial production equipment to trip. It also provides time for the facility to transition to traditional backup power resources (e.g., emergency generators) more effectively and without the combustion of additional fuel. On the utility scale, the Project will, in the long-term, assist in maintaining the stability and efficient operation of the electric grid by providing peaking capacity and balancing services including reserve capacity, frequency regulation, voltage support, and harmonic distortion power curing. Stress relief also means improved system reliability. BESS' modern power electronics systems allow grid balancing and stabilization services within milliseconds, preserving the safe, efficient operation of the grid. As a larger portion of the grid's energy is composed of intermittent renewable resources (such as solar and wind), distributed energy storage systems can help "smooth" the surge and lull of voltage, frequency and harmonic distortions that are inherent with the rapid integration of renewable energy systems.
- (3) Environmental Benefits: Under the ESSP, BESS are used as localized peaking power suppliers. As such, BESS will help reduce air quality impacts of high emitting peaker plants which are called-on as resources of last resort during peak demand times. Further, to achieve its renewable energy goals, Connecticut is relying in part on the installation of a substantial amount of energy storage to balance the grid and "smooth" the intermittent output of solar and wind generation resources. The adoption of renewable power can only happen effectively with energy storage to assist the grid in accommodating the added resources. Locally, the host site's environmental footprint will improve since the BESS will charge at night when the ISO-NE's power supply is comprised of a higher percentage of non-carbon-based resources, and then discharge that energy to serve the facility and grid during peak demand hours when the high emitting, least efficient, fossil fuel-based peaker plants are typically used.

The result is overall positive net value to the host and all ratepayers as sought in the PURA and CTGB's EESP.



#### V. PROJECT DESCRIPTION

Designed in accordance with the ESSP's Program Manual,<sup>4</sup> and with input and guidance from The Connecticut Light and Power Company dba Eversource Energy ("Eversource"), the Project consists of a 4.9MW/9.8MWh BESS to be installed at the Site. The Project would be designed, built, owned, operated, maintained, and financed by Endurant and will participate in the State of Connecticut EESP. CPower, Endurant's sister company, will provide asset dispatch optimization and market enrollment services. After construction, the Project will be owned by a new special purpose entity that will be created by and wholly owned by Endurant Energy. The new special purpose entity will contract with Endurant Energy to obtain and hold necessary permits for construction and operation of the Project. Endurant is securing final quotes from battery suppliers that have been pre-approved by the ESSP Program Administrators to supply the battery equipment.

#### A. SITE

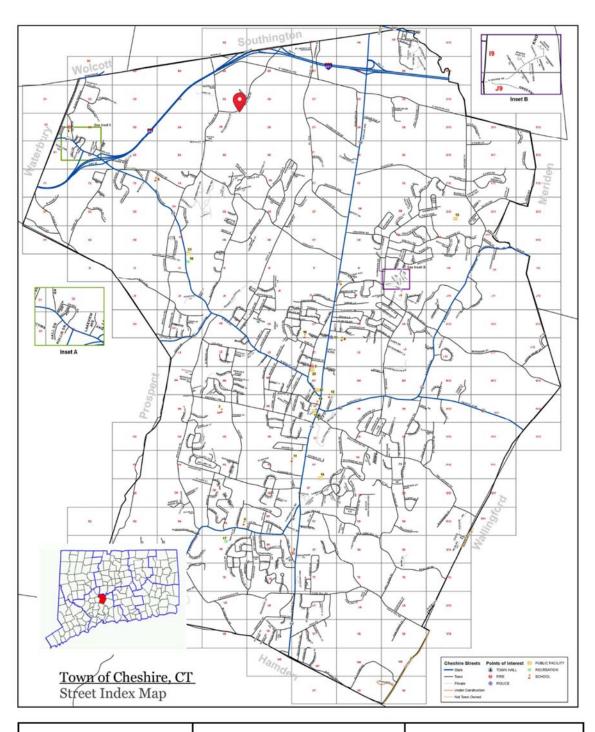
The Project will be located at a manufacturing facility operated by Accel in Cheshire, Connecticut. Accel is a producer and manufacturer of silver-plated, nickel-plated and tin-plated copper and copper alloys for the wire and cable market, with a production facility located at 350 Knotter Drive in Cheshire and shown on Figure 1. Accel operates heavy equipment to produce wire and cabling products within the approximately 165,000 square-foot manufacturing facility (the "Facility").

The footprint of the Project including setbacks will be approximately 6,000 square feet, located on a cleared, mowed, and partially paved section of the property (the "Site"). The Site and the Facility are zoned as I-2 Light Industrial. The Project Site is on a developed site, consisting of mostly of cleared, mowed lawn area and partially impervious paved surfaces (parking lot). The BESS containers will be installed on concrete pads within a fenced area that is eight feet tall and includes industry-standard and OEM-prescribed setbacks.

The Site is accessed off Knotter Drive by an existing paved drive to the north, east and south of the Facility. The specific Project Site took into consideration comments from the Town of Cheshire Fire Department regarding access. Figure 2 depicts plan and elevation views of the Site. Figure 3 depicts the Project equipment overlain on an aerial view.

 $<sup>^4\</sup> https://energystoragect.com/wp-content/uploads/2023/06/ESS-Program-Manual\_Updated-6.23.2023\_CLEAN.pdf$ 







Battery Energy Storage System
Accel International
350 Knotter Drive
Cheshire, Connecticut

Figure 1 Site Location









Battery Energy Storage System
Accel International
350 Knotter Drive
Cheshire, Connecticut

Figure 2
Plan View and
Site View from Knotter Dr.







Battery Energy Storage System Accel International 350 Knotter Drive Cheshire, Connecticut

Figure 3 Equipment Overlay



## **B. PROJECT EQUIPMENT**

All battery systems under consideration for the Project comply with latest UL, IEEE, and National Fire Protection Association ("NFPA"), testing regimes, and specifications, including UL 9540. The installation will include four fully containerized, UL certified and NFPA 855 compliant lithium-ion battery modules, external inverters, transformers, and switchgear.

Currently, the Project is expected to use Canadian Solar Inc. ("CSI") Energy Storage SolBank 0.5P lithium iron phosphate ("LiFePO4") chemistry-based battery modules with liquid cooling, humidity control, and an active balancing Battery Management System or similar. The battery modules will export DC electricity to an EPC power converter, which are UL 1741 listed and UL 1547 compliant for interconnecting and islanding capability, which will convert the electricity to AC, and step the voltage up to 13.8kV before connecting to the utility distribution network's 13.8kV feeder.

The sample specification sheet in Appendix A provides the technical details on the proposed battery modules for the battery system and presents system renderings. The final battery system's make and model may change to accommodate Eversource's feedback and supply chain constraints, but the core technology presented in this Petition will be the same.

The Project term is for 10 years, with the ability to extend thereafter. The battery capacity will degrade naturally without augmentation or capacity maintenance unless market and economic conditions change to make that option desirable. In year 10, the battery cells may be replenished with newer cells to increase the system's capacity, but this will depend on the health of the battery system at that time and cost of capacity maintenance. The BESS' internal monitoring systems will allow Endurant to monitor and diagnose the health of each cell individually over time.

## C. Interconnection

The Project is in the final stages of the interconnection process with Eversource. Endurant filed an interconnection request for the Project on May 20, 2022, with Eversource and has been assigned project number INT-63091. A project Feasibility Study Agreement was executed on December 31, 2022, and an Impact Study Agreement was executed on March 29, 2023, with results expected shortly. The Interconnection Agreement is pending with project completion anticipated for Q1 or Q2 2025. The utility has preliminarily determined that the Project will not likely need an ISO-NE study to be completed. A final determination is expected by August 31, 2023.



The Project will electrically interconnect to the utility's 13.8kV distribution feeder on Knotter Drive via an underground conduit. Upon a grid fault or outage, the system will disconnect from the grid to provide resilient power to the host Facility ("island mode"). When power services have resumed, the Facility will reconnect to the grid to maintain normal, "blue sky" operations.

## D. MUNICIPAL/LOCAL INPUT AND COMMUNITY OUTREACH

Endurant Energy, in partnership with its subcontractor, Berkshire Environmental Consultants, contacted and spoke with the Town of Cheshire municipal officials, including the Cheshire Town Planner, Fire Marshal and Chief of the Fire Department. A letter describing the Project was sent to the Town Manager on August 7, 2023. Detailed logs of the contacts with local authorities about the Project are presented in Appendix B.

Among the topics discussed with the Town Planner were zoning requirements, including setbacks, screening, wetlands, and floodplain locations, building, electrical and mechanical permit requirements, fire plan review, and permitting procedures. The Cheshire Zoning Map with the Project identified is shown in Appendix C.

The Town of Cheshire Fire Marshal and Fire Chief were contacted and provided information about the Project, including specific fire safety-related information. A meeting was held with Endurant, Berkshire Environmental Consultants, the Cheshire Fire Marshal and the Chief of the Cheshire Fire Department to review the Project and to discuss the fire safety systems of the BESS, the detection and fire alarm systems, incident response, and fire department concerns and equipment needs. The Fire Department input has been used in the development of emergency plans and identification of fire safety equipment. The Project location was modified following Fire Department feedback, to ensure that access to the southern and western side of the Property is not impeded. Endurant will continue to seek Fire Department input through the design-build stage, including ensuring clear disconnection signage, providing fenced area access, and emergency disconnection equipment. Endurant will also continue to work with the Fire Marshal during the Fire Plan Review process and in finalizing the Emergency Response Plan. Once the system is installed, Endurant will work with the Fire Department to develop and provide training resources.

#### E. PUBLIC NOTICE AND COMMUNITY OUTREACH

Endurant has provided notice of this Petition via certificate of mailing to all persons and appropriate municipal officials and governmental agencies to whom notice is required to be



given pursuant to RCSA § 16-50j-40(a).<sup>5</sup> Notices have been given to property owners within 250 feet of the Property boundary and are identified in Appendix D, in addition to a map indicating the abutter properties and a sample copy of the notice letters.

#### F. PROJECT COST

Total Project capital costs will be approximately \$7 million. Costs will be recouped through payments made from the State of Connecticut Energy Storage Solutions Program, administered by the CTGB, to the Project. Energy will be purchased at retail energy market rates according to the customer's utility tariff. Before the Project is finalized, a commodity supply agreement with a supply provider may be established.

#### VI. NO SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT

The Project will have no substantial adverse environmental effect. Battery systems do not store or contain fuel, e.g., hydrocarbon fuels, which can cause environmental impacts. Further, the BESS will not generate regulated air emissions, will not have an adverse impact on water resources or stormwater runoff, and will not impact endangered species.

#### A. AIR QUALITY

Battery storage systems do not produce any air emissions of criteria air pollutants and/or hazardous air pollutants regulated by the Clean Air Act and Chapter 446c – Air Pollution Control of the Connecticut General Statutes because the system does not combust fuel or use any volatile organic compounds or other chemical pollutants that would be released to the atmosphere during normal operation. As such, an air permit is not required for the construction or operation of the battery system.

The liquid coolant system, used for cooling battery cells, uses a glycol-based coolant. The air-cooling system, used for cooling electrical components, uses HFC-134a refrigerant. Both cooling systems are closed loop with no emissions released during routine operations. R134a is a non-ozone-depleting hydrofluorocarbon ("HFC"). It was one of the first refrigerants developed to replace Chlorofluorocarbons which are ozone-depleting substances, and has a

<sup>&</sup>lt;sup>5</sup> RCSA § 16-50j-40(a) in part provides: "Prior to submitting a petition for a declaratory ruling to the Council, the petitioner shall, where applicable, provide notice to each person other than the petitioner appearing of record as an owner of property which abuts the proposed primary or alternative sites of the proposed facility, each person appearing of record as an owner of the property or properties on which the primary or alternative proposed facility is to be located, and the appropriate municipal officials and government agencies...The term "appropriate municipal officials and government agencies" means, in the case of a facility required to be approved by declaratory ruling, the same officials and agencies to be noticed in the application for a certificate under Section 16-50l of the Connecticut General Statutes...".



lower environmental impact potential than other refrigerants. The Project is required to use licensed HVAC contractors trained to minimize or eliminate risks during maintenance activities.

During construction, short-term fugitive particulates and emissions from diesel exhaust may result from soil handling and construction vehicles. Fugitive particulate emissions from soil handling will be limited since soil disturbance is expected to be minimal with no significant storage piles. Additionally, construction vehicles will be expected to comply with CT DEEP idling requirements and operate only as needed. Therefore, any emissions resulting from their operation will also be minimal. If necessary to control fugitive dust, water spray will be used during construction.

## **B.** WATER QUALITY IMPACTS

#### 1. Wetlands and Watercourses

The Project Site is not located in a mapped wetland delineated area, as determined by the wetland soil map provided by the Town of Cheshire GIS and the Connecticut Geodata Portal Soil Survey Geographic Database Inland Wetland Soils maps. Based on the distance from the site to mapped wetland locations, and the fact that the Project will be installed at a location that has been previously developed, no impact on wetland soils is anticipated. Seasonal depressional wetlands, also known as vernal pools, are not present on the Site. There are no watercourses at the Project location. The Cheshire GIS wetland overlay map and the CT Geodata Portal Inland Wetland Soils Map, both identifying the Project location, are presented in Appendix C. Based on the foregoing, the Project is not expected to negatively impact any wetlands or watercourses.

## 2. Aquifer Protection Areas

There are no aquifer protection areas at the Project location. The CT DEEP Water Quality Classification Map, which delineates aquifer protection areas relative to the Project location, is shown in Appendix C. The Groundwater Class at the location of the Project is Class GB as shown in the map in Appendix C. Class GB designated uses are industrial process water and cooling waters. Baseflow for hydraulically connected waterbodies and use is presumed not suitable for human consumption without treatment. There are no service areas of Community Public Water Systems, Drinking Water Watersheds or Private Well Parcels at the Project site, as shown in the Water Supply Map in Appendix C.

The Project has no normal operating processes that will impact groundwater or surface water. During a fire emergency, firewater may be generated as a part of response activities, however, the overall approach of response is not water deluge of the batteries, but to allow



self-extinguishing, and to use water to control impacts on adjacent structures to prevent spread. Firewater generated would not be dissimilar to what is generated during routine fire response of manufacturing buildings and electrical equipment. Fire response and firewater management are further discussed in the Safety section of this Petition.

## 3. FEMA Flood Zones

A review of the Federal Emergency Management Agency's ("FEMA") National Flood Insurance Program flood mapping data shows that that the Project location is not within the 100-year Flood Zone. This determination was confirmed by the Cheshire Town Planner. The enclosure fencing on the eastern side of the Project will be in close proximity to the mapped 0.2% Annual Chance Flood Zone (500-yr Flood Zone), indicated on the map as Zone X. The FEMA flood hazard area and the location of the energy storage system are shown in Appendix C.

# 4. Stormwater

The area of site disturbance for the Project is less than one acre and will not require a CT DEEP General Permit for Discharge of Stormwater and Dewatering Wastewaters for Construction Activities. The battery system is contained within a weather resistant enclosure, and as such, there is no stormwater contact with the battery system components. No routine industrial stormwater permitting is triggered by the Project.

## C. WASTE

During the Site clearing and construction phases, construction debris and other solid waste will be generated and managed by Endurant and its construction contractor. No hazardous waste is expected to be generated during the construction phase, unless there are small equipment leaks from vehicles. Any vehicle fluid leak will be managed in accordance with the applicable CT DEEP requirements.

During normal operations, the only waste products that will be generated by the Project will be the result of maintenance activities, such as coolant and refrigerant change out or maintenance product usage. The servicing of the HVAC system will be contracted to a registered HVAC servicing company. Maintenance activities are expected to occur semi-annually. Refrigerant changeouts would typically be recycled. The R134a change out would be closed piped to a recovery tank. Any waste oils or lubricants will be collected and managed in accordance with CT DEEP regulations. Occasional vehicle or truck traffic on the site for maintenance activities may result in vehicle fluid leak which will be managed in accordance with the applicable CT DEEP requirements.



#### D. HAZARDOUS MATERIALS

An inventory of hazardous materials expected to be onsite during construction and during normal operations, is presented in Table 1 below. The exact products to be used will be determined during construction and installation. Representative Safety Data Sheets for comparable products are contained in Appendix E for reference. There will be no fuel or hazardous material storage at the Project site, beyond the quantities contained in the equipment.

Equipment containing hazardous materials will be routinely inspected as part of the maintenance inspection program developed and conducted by the OEM contractor.

Table 1: Hazardous Material Inventory						
NORMAL OPERATIONS						
Product	Use	Approx. Quantity On-Site				
Air cooling system refrigerant – HFC - 134a	HVAC cooling of battery electrical equipment	35.3 lbs. per BESS container				
Liquid cooling system – glycol-based coolant	Cooling of battery cells	84.8 gal per BESS container				
Transformer Oil	Electrical Insulating oil	Approx 500 gal per transformer				
Lithium-Ion Electrolyte	Storage of electrical energy	48 gal per BESS container				
SIT	E PREPARATION AND CONSTRUCTION					
Product	Use	Quantity On-Site				
Construction Vehicle Fluids	Fuel, oil, hydraulic and other oils used in site vehicles, and heavy equipment used during installation.	Variable				

#### E. WILDLIFE AND HABITAT

The CT DEEP Natural Diversity Database ("NDDB") maps general locations of endangered, threatened, and special concern species as well as rare natural communities. The NDDB Area Map indicates that the Project location is not in a mapped NDDB area. See the figure in Appendix F. The NDDB Site Assessment tool results indicated that there are no populations of state endangered or threatened species or critical habitats located at the Project site, however there are two species of State Special Concern documented within or in close proximity to the Project area. These species are the Eastern Ribbon Snake (*Thamnophis sauritus*) and the Wood Turtle (*Glyptemys insculpta*). It is not expected that the project will create a substantial impact on state-listed species since the site development will be conducted on an existing developed site. A CT DEEP NDDB filing was made for a project review consultation and when it is complete,



Endurant will submit the results and follow-up actions to the Council.

The Project Site is not in or adjacent to any of the State's Protected Wildlife Management Areas. The CT DEEP NDDB map and the site assessment identifying the Project location are presented in Appendix F.

The Endangered Species Act, 16 U.S.C. § 1531 et seq. protects federally threatened and endangered wildlife. Listed species and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service ("USFWS") and the fisheries division of the National Oceanic and Atmospheric Administration. The USFWS Information for Planning and Conservation ("IPaC") tool was used to identify potentially affected listed species and their habitat. The Northern Long-eared Bat (*Myotis septentrionalis*, endangered species) and Monarch Butterfly (*Danaus plexippus*, candidate species) were identified. However, the IPaC report indicates that there is no Critical Habitat within the vicinity of the Project area for either species. The report is provided in Appendix F.

#### F. PRIME FARMLAND AND CORE FOREST RESOURCES

The Soil Survey of the State of Connecticut map (2008) indicates that soils at the Site are unit #306 Udorthents - Urban Land Complex. The General Soil Map of Connecticut (1978) indicates it is map unit #22, Branford-Manchester: Reddish, nearly level to rolling, deep well drained and excessively drained soils with a sandy and gravelly substratum; on terraces.

None of the soils at the Project location are mapped as prime farmland or farmland soils of statewide importance, nor are they identified as Core Forest. As such, construction of the Project will not impact Prime Farmland or Core Forest resources. These maps are provided in Appendix C.

## **G.** Noise Analysis

Cavanaugh Tocci Associates has evaluated the environmental sound impact associated with the proposed BESS. This evaluation's objectives were to define the acoustic design goals based on applicable noise regulations and to estimate and evaluate the acoustic impact of the proposed Project in the surrounding community. The battery system will be about 1,100 feet from the nearest business and over 2,000 feet from the nearest residence.

Based on Cavanaugh Tocci's review of the Project and the BESS and inverter noise study reports, sound produced by the proposed BESS Project will comply with the most stringent requirements of state and local noise regulations. Furthermore, the firm concluded that the sound emitted by the Project will not produce a noticeable impact on the acoustic environment



and will not have an unreasonable adverse effect on any surrounding properties. The complete Facility Sound Assessment is in Appendix G.

# H. VISUAL IMPACT / SCENIC VALUES

The Project will be situated on a 75-acre, existing manufacturing facility location, which is in an industrial park setting. The Project will be enclosed in a securely fenced area at the Facility's southern end. Fencing slats will be used to screen the Project equipment. Due to the location of the Project, it will be screened by the Accel building, and will not be visible from Knotter Drive. The Cheshire Town Planner did not suggest any additional screening in reviewing the Project. As the Project is being added to an existing industrially developed property in an industrial park and out of view from public roads, it will not create a substantial change in the visual and aesthetic characteristics of the Project area. Further, the Project equipment is consistent in design and aesthetic with the current uses at the facility.

# I. CULTURAL RESOURCES / HISTORICAL VALUES

The Project will not have any adverse effects on the state's historic or archaeological resources.

A search in the National Register of Historic Places ("NRHP") map indicated that there are no NRHP listed properties within a half mile of the Project Site. See Appendix H. The closest NRHPs to the Project are the Farmington Canal-New Haven and Northampton Canal (0.8 miles from the Project Site), the Marion Historic District (0.9 miles) and the Barnes-Frost House (1.4 miles). Based on the distances to NRHP properties, and the limits of the Project scope as well as intervening structures, there will be no impact on historic places. Further, the height of the Project will not exceed the height of nearby buildings.

## VII. PROJECT CONSTRUCTION, OPERATION, MAINTENANCE AND DECOMMISSIONING

## A. PERMITS REQUIRED

The Project will require local permits, including a Building Permit, which includes a Fire Plan review, a Mechanical Permit, and an Electrical Permit. Permit applications will be submitted following the Council's determination.

## B. Construction

The on-site construction phase will commence when the Interconnection Agreement is executed, and the Council's determination has been issued. Following these key milestones, Endurant anticipates that by Q4 2023, advanced engineering design work will be completed,



final permits will be secured, and equipment purchase orders will be placed. On-site activities will begin in Q1-Q2 2024. On-site construction is anticipated to take no more than six months.

The Project will require minimal construction or disruption to the existing site since the site is already developed. No land clearing or tree removal is required. There will be some removal and cutting back of overgrown brush that has encroached on the periphery of the Project Site. Initial site work will include installation of a construction fence to shield most site activities, excavation, installation of below ground conduits and pouring concrete pads. Trenches to accommodate the laying of new conduit will be dug from the BESS Site to the Facility's electrical room where the BESS will be connected to the distribution infrastructure. These excavation and grading phases are minimally disruptive and will be coordinated with the site host to minimize operational impacts.

The installation of the major battery equipment is also expected to have minimal environmental impact. Pre-packaged containerized modules will be shipped to the Site from the production facility and will be dropped onto the poured concrete pads and connected via the newly laid conduit to the distribution infrastructure. Once installed, the battery system will be commissioned, tested, and activated for commercial operation. Commercial operation is expected prior to the 2025 ESSP program season, scheduled to start June 1, 2025.

## C. TRAFFIC/PUBLIC TRANSPORTATION

During the construction phase of the Project, there will be minimal impact to traffic on Knotter Drive. There will be a short-term small increase in the number of construction vehicles and equipment coming onto the Accel Property from Knotter Drive. The driveway and parking areas on the property are large enough to accommodate the staging and parking of any construction vehicles or heavy equipment needed for site work and construction activities. Onsite traffic controls will be utilized to minimize any impact to typical traffic patterns and the Town of Cheshire Police Department will be notified prior to delivery of the equipment. Once installation is completed, the only additional traffic will be during periodic equipment inspection and routine maintenance activity.

There are no bus stations or railroad lines within or in close proximity to the Project Site.

#### D. FAA DETERMINATIONS

There are no airfields in the immediate vicinity of the Project Site. The closest airfield to the Project is the Burke Heliport (OCT4), located 3.0 miles south of the Project Site. Other nearby airfields include the Meriden Wallingford Hospital (KCT95) located 6.0 miles from the Project,



the Meriden Markham Airfield (MMK) located 5.0 miles from the Project and the St. Mary's Hospital Heliport in Waterbury, located 6.2 miles from the Project.

The Federal Aviation Administration Obstruction Evaluation Tool was used to assess Notification Criteria for the permanent battery positioning and for the temporary use of a mobile construction crane during the project's construction phase. Based on the site-specific data entered for the Project, Site elevation and structure height for each scenario, the results indicated that the Notice Criteria under 14 Code of Federal Regulations, Part 77.9 were not exceeded for either scenario. These Notice Criteria Tool outputs are presented in Appendix I.

Notwithstanding this determination, Endurant will coordinate the use of the construction crane with the aviation facilities, so that they can be aware of the presence of the crane and factor it into their operations.

## E. OPERATIONS

During "blue sky conditions," i.e., normal grid operations, the BESS will operate to provide peak demand management and demand response. From June 1 - September 30 and as per ESSP call windows, the BESS will discharge, for 2-3 hours between 3:00 p.m. - 8:00 p.m. During the June - September period, the BESS will charge at night, typically from approximately 11:00 p.m. - 6:00 a.m. The amount of time it will take for the battery to charge will depend on energy prices and the host facility's energy demand. Typically, charging will occur over several off-peak hours. During shoulder and winter seasons, the BESS will charge at similar times, but discharge over a longer period to manage the site host's peak demand charges.

While the battery energy storage system will be owned and operated by Endurant. CPower, Endurant's sister company, will provide the dispatch optimization services for the battery, signaling the on-board management system to charge and discharge at economically and technically optimal times. "Active" or "Passive" calls will depend on when Program Administrators (the utility) calls on the asset to dispatch. CPower is one of the largest, most experienced demand response and demand management providers in the country and utilizes its "Enerwise" technology to receive signals from grid operators and relay those calls to the battery system.

During "black sky conditions," or grid outage events, the BESS will provide resiliency and power quality services, i.e., back-up power, to the Facility. During grid outages, faults or other electrical disturbances and per UL and utility interconnection rules, the BESS will be able to fully disconnect from the grid to continuously power the Facility, operating in "island mode." The system will be IEEE 1547 and UL 1741 SA compliant. Once the grid outage is over, the BESS



and Facility will reconnect to the distribution network. The amount and duration of backup power will depend on the battery's state of charge when the outage occurs. Even if the battery's state of charge is low at the time of an outage, it will be sufficient to allow the Facility to continuously operate for some time, buying the staff valuable time to transfer to traditional start-up backup power resources. This is critically valuable during winter storms when backup generators may need additional startup time, and/or fuel may be inaccessible, as many Connecticut residents experienced during Winter Storm Alfred and Hurricane Sandy.

The BESS will be capable of participating in other ISO-NE markets, such as energy, forward capacity, and ancillary service markets once ISO-NE develops new participation rules for behind-the-meter resources to do so.

The BESS' inverter systems can dispatch almost instantaneously once called by the controls system. Typically, this is a matter of milliseconds. However, utility calls are sent 24-hours in advance under the ESSP program rules. While it is operating, the battery system will be remotely monitored 24/7. The Project will be equipped with Battery Management Software ("BMS") that uses supervisory control and data acquisition ("SCADA") systems to initiate automated procedures or responses by personnel.

The Project term is 10 years, with an option to extend for additional periods. The battery system will degrade naturally without augmentation or capacity maintenance unless market and economic conditions change to make that option desirable. In year 10, the battery cells may be replenished with newer cells to increase the system's capacity, but this will depend on the health of the battery system at that time and cost of capacity maintenance. The BESS' internal monitoring systems will allow Endurant to monitor and diagnose the health of each cell module individually over time.

#### F. MAINTENANCE PLAN

Unlike rotating machines such as combustion engines or gas turbines, battery energy storage systems require little maintenance. To honor the battery warranty, the BESS suppliers require that the battery's maintenance be conducted by the battery manufacturer and its subcontractors for the full life of the Project. The supplier's staff and subcontracting teams have been trained specifically on the modules and equipment installed on-site. Bi-annual planned maintenance events will occur, typically before and after the summer ESSP season to ensure the system will be fully available for that season-year.

Maintenance activities include a full checklist of items to ensure system integrity and availability for peak operation. These include a full testing of the BESS safety systems, backup



power and cooling systems. The OEM Maintenance Plan will be provided by the manufacturer once the final decision is made on the equipment.

#### G. DECOMMISSIONING PLAN

At the end of the Project's Operation Phase, including any extensions, the Project equipment, including the battery containers, will be removed and the Site will be returned to its original condition before the battery system's installation (or as otherwise directed by the facility owner). This will include removing the battery modules, switchgear, inverters, transformers, cabling, concrete pads, fencing, ethernet, and other infrastructure installed, and installing pavement and sod as needed. New shrubs, trees or other plants may be added as requested by the facility owner.

The accelerating adoption of grid-scale battery energy storage systems has created new markets and business opportunities, including for recycling the battery systems. This includes an off-site deconstruction of the battery's components, isolation of its elements and raw materials (including lithium, copper, nickel, cobalt, etc.). The potential has created a wave of new companies offering battery recycling and repurposing for the types of systems being proposed as part of this Project.

Newer methods of more efficient battery recycling are the subject of research, including advanced development of cathode re-lithiation processes, binder removal and recovery, and black mass purification. New thermal techniques are also being developed to identify any contaminants resulting from the recycling processes themselves.

Endurant intends to use the most advanced recycling and repurposing methodologies available at the end of the equipment's life if the materials cannot otherwise be reused.

# H. SAFETY

# 1. Site Security & Safety

The battery system is surrounded by an 8-foot-high security fence, with locked access. The unit will be in a frequently used, well-lit, parking area at the southern end of the Property. Fire Department access to the locked gate will be provided by a Knox Box or other universal key system. Personnel will not be allowed within fenced areas during normal operation and all systems will be locked out during inspection or maintenance. No fires, flames or sources of heat are allowed within the fenced area. Contractors will be trained in safe work practices around electrical equipment and specifically BESS. The Site and electrical room will be outfitted



with proper signage designating hazards and confirmation of electrical disconnects for both the BESS and the host facility.

# 2. Electric and Magnetic Fields (EMF)

During operation, electric and magnetic fields ("EMF") from the Project will derive from: 1) the DC battery banks; 2) the DC cables connecting the battery banks to the power inverters; 3) the AC power inverters that convert the DC power to AC power; 4) and the 13.8-kV AC underground lines connecting Project to the existing service in the customer's electrical room. There will be no additional EMF from the existing utility interconnection.

The battery banks and DC cables on site will produce static fields (i.e., at 0 Hertz). These sources will not be expected to produce any significant disturbance to the existing levels of static magnetic field produced by natural sources within the earth (i.e., the earth's geomagnetic field) away from the Project location. The existing level of the earth's static geomagnetic field is about 8,000 times lower than the standard for exposure of the general public to static magnetic fields recommended by the International Commission on Non-ionizing Radiation Protection (ICNIRP, 2009).

The power inverters and underground AC lines on site will produce AC fields at frequencies greater than 60 Hz on site. These higher-frequency fields from the inverters, like the DC fields from the battery banks, decrease rapidly to low levels within a few tens of feet or less<sup>6</sup>. These components are located significantly far from any potentially affected receptors and thus will not be an important contributor to AC fields outside the Project boundaries. Additionally, electric fields are blocked (i.e., shielded) by most grounded conducting objects, including buildings, walls, trees, and fences.

## Fire Safety

Safety and fire protection are designed into the Project in multiple ways.

<u>Battery Design</u> – Stationary battery energy storage system design continues to evolve to keep pace with the evolving standards and lessons learned from performance and fire incidents. The battery system is designed for compliance with the most recent and stringent of battery safety standards, including NFPA 855, UL 1642, UL 1973 and UL 9540. In addition to meeting the UL 9540 standard, the system has been tested using the UL 9540A testing methodology. These tests are not pass/fail, but rather destructive tests used for evaluating the thermal runaway impacts of a BESS design including

<sup>&</sup>lt;sup>6</sup> Tell TA, Hooper HC, Sias GG, Mezei G, Hung P, Kavet R. Electromagnetic fields associated with commercial solar photovoltaic electric power generating facilities. J Occup Environ Hyg 12: 795-803, 2015.



propagation, extent of gassing, explosion, or fire. The UL 9540A SolBank Unit Level Test results found the following:

- No module to module or unit to unit thermal runaway propagation
- No flying debris or explosive discharge of gases during the test
- No electrical arcs or other electrical events during the test
- No external flaming observed.

<u>Detection and Alarm Systems</u> – The BESS is equipped with combustible gas detectors to detect the most prevalent flammable/explosive off-gases from lithium iron phosphate battery cells – hydrogen, carbon monoxide and methane. Industry standards recommend either explosion vent panels (deflagration panels) or automatic exhaust venting to address explosion prevention. The BESS is equipped with an exhaust fan that vents flammable/explosive gases upon detection by the gas detection system. The BESS design also integrates several safety features including a temperature detector, a smoke detector, a fire alarm (audible and visual), an alarm panel and manual emergency stop buttons. For explosion protection, the BESS is equipped with combustible gas sensors, an exhaust fan and pressure balancer. The system is not equipped with an inert gas suppression system (which reduces oxygen levels in confined spaces) given that the system is vented thus preventing effective reduction of oxygen levels.

<u>Battery Management System</u> - The BMS constantly monitors cell and pack level voltage, temperature, status of the various detectors (smoke, temperature, and gas) and other parameters to ensure early detection of pre-fault conditions, and immediate detection of fault events. Should any parameter exceed a permissible value, the BMS will surface appropriate alarms and take appropriate protective actions including the potential to disconnect the affected string.

## 4. Fire Response

There are many factors to consider in determining the appropriate response to an incident at a battery storage facility. Endurant has worked with the Cheshire Fire Department to discuss fire response options and strategies, and ways that Endurant can support the Department, through information, training, and other resources. Life safety and protection of adjacent properties are the response priorities. A battery fire at the Project should be monitored for propagation to other hazards and allowed to burn itself out. First responders should not enter the fenced area other than for life safety concerns. Water may be used, at the Fire Department's discretion, to control the temperature of adjacent hazards that are not fire



involved. Water has not been shown to be effective in extinguishing a lithium-ion fire but can be used to limit the potential spread of fire to adjacent structures. The Project location and configuration at the Property provide a buffer from adjacent buildings. Based on the UL 9540A testing results, and the lack of unit-to-unit propagation observed, it is expected that any fire at the Project will be contained within the affected battery module.

Fire Department access to the facility will be gained through the main entrance to the facility from Knotter Drive, along the facility driveway and to the south of the facility where the BESS is located. There is adequate space for staging and response activities, and the parking lots to the east of the building can be cleared, if additional space is necessary for Incident Command activities.

During Endurant's meeting with the Fire Department, access to fire prevention water was discussed. A municipal hydrant is located at the facility entrance on Knotter Drive. Additional discussion on access to water will continue with the Fire Department as part of the Fire Plan review process. As discussed above, water is used to cool adjacent buildings and to prevent the spread of fire. Neither water, nor any other fire suppressants (i.e., foams, etc.), have been shown to extinguish a lithium-ion fire. Accordingly, neither water deluge nor suppressant media are recommended fire responses. Any fire water generated from the response will be from cooling adjacent buildings and electrical equipment to prevent spread of fire, and as such, does not come into contact with the batteries, which are contained in weather-proof enclosures. Fire water makeup would be consistent with that generated during routine fire response of manufacturing buildings and electrical equipment.

## 5. Off-Gas Composition

Battery system modules are designed to be maintained within a safe temperature range via the thermal management system which controls the internal system temperature through heating and cooling. At normal operating temperature, there is little or no off-gassing from the batteries. In a thermal runaway or fire, elevated temperature causes off-gassing from the battery cells. Gas composition is determined by the battery's chemistry. Off-gas from lithium iron phosphate batteries during thermal runaway or fire is generally characterized as follows:

Gas Component	Percent (by volume)	
Hydrogen (H2)	48.013 %	
Carbon monoxide (CO)	11.191 %	
Carbon dioxide (CO2)	27.325 %	
Hydrocarbons (HC)	12.999 %	



The danger of these components is their ability to form an explosive mixture with air. The UL 9540A tests indicated resulting gas concentrations during thermal runaway of much less than 25% of the Lower Flammability Limit ("LFL") which is the concentration at which it will reach a flammable point. A 25% LFL concentration is the first alarm trigger for the gas detectors installed in the units (50% is the next).

The systems incorporate active venting to reduce the buildup of flammable gases to mitigate hazards associated with the amount of off-gas produced. The density of any vented off-gasses will be lighter than air thus allowing them to rise and disperse and minimize the risk of creating a localized explosive atmosphere.

# 6. Emergency Planning

Endurant has developed an Emergency Response Plan ("ERP") that documents the procedures in place to prepare for and respond to an emergency at the BESS Project Site. The ERP delineates emergency response responsibilities of personnel and identifies mutual aid resources available by off-site responders. It also identifies training provided to site personnel in responding to emergencies and identifies drill procedures and incident investigation procedures. The ERP has been prepared as part of Project planning. The plan will be updated to reflect additional site-specific input generated as part of the permitting process and with further consultation with the Cheshire Fire Department. A running record of changes and updates will be maintained with the plan. The ERP is provided in Appendix J.

## VIII. CONCLUSION

For the foregoing reasons, Endurant Energy respectfully requests that the Council issue a determination that the proposed Project as described in this Petition will not have a substantial adverse environmental effect, and therefore, that a Certificate is not required.