

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 an 18.0- :
megawatt Battery Energy Storage System to be Located at 1 Ucar :
Street, Suffield, Connecticut, and Associated Electrical :
Interconnection : December 18, 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 an 18.0-megawatt ("MW") Battery Energy Storage System ("BESS"), a 13.8kV electrical interconnection, and associated equipment (together, the "Project") at 1 Ucar Street, Suffield, 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 46,000 MW 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. 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.

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

Emma Walker
Vice President, Commercial Development
Endurant Energy
150 N. Michigan Avenue, Suite 1250
Chicago, IL 60601
(312) 465-3430
ewalker@endurant.com

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

Bruce L. McDermott
Murtha Cullina LLP
265 Church Street
New Haven, CT 06510
(203) 772-7787
bmcdermott@murthalaw.com

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 System Planning of the Electric Distribution Companies – Electric Storage, establishing a statewide energy storage program, known as the "Energy Storage Solutions Program" or "ESS Program"*. 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 ESS Program.

The Project at the center of this Petition is one of the C&I projects that was selected and approved by the Authority in July 2022.

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”).

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.”¹ 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.”²

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.

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 1970s, the electric grid is

¹ 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.

² 2022-2024 C&LM Plan at 16-17.

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 here, Praxair, Inc.) 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, both as a distributed asset, and as a physically secure and 24/7 remotely monitored asset, is part of Connecticut’s evolution towards a more secure and resilient energy system.

D. PROJECT PURPOSE

The purpose of the proposed Project is to meet the goals of the ESS Program. It will do so by offering benefits to Praxair, Inc. (and by extension their parent company, Linde Inc.), 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.” (ESS 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, providing it has not been called upon by the ESS Program Administrator, which will have priority access to the dispatch. 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 ESS Program 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.

E. 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 ESS Program 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, (the legal entity which owns the parcel is Praxair Inc.) 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 ESS Program 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 that will allow 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 Praxair, Inc. 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 ESS Program, 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 ESS Program.

III. PROJECT DESCRIPTION

Designed in accordance with ESS Program's Manual,³ and with input and guidance from the Connecticut Light & Power Company dba Eversource Energy ("Eversource"), the Project consists of an 18.0MW/36.0MWh BESS to be installed at the Site. The system will include transformers to step-down the 13.8kV AC grid voltage to the 690V required to recharge the batteries. Inverters will convert the energy from AC to DC. The 18MW output is based on the point of electrical interconnection, but may be adjusted slightly when interconnection is finalized with Eversource.

³ https://energystoragect.com/wp-content/uploads/2023/06/ESS-Program-Manual_Updated-6.23.2023_CLEAN.pdf

The facility will operate between 0 and 18MW. Each module will be dispatched on need, either as required by the host facility, or the utility, or in cases where neither requires it, into the wholesale markets. The system can 'balance' between each container, to optimize the system. 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 ESS Program rules.

The Project would be designed, built, owned, operated, maintained, and financed by Endurant and participate in the State of Connecticut ESS Program. The Project was selected for the state ESS Program and received its "Reservation of Funds" from the CTGB and PURA in July 2022. 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. The new special purpose entity will contract with Endurant 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 ESS Program Administrators to supply the battery equipment.

Endurant will select a battery supplier when it is confident that all of the permitting and regulatory obligations have been completed. The timing will depend on factors such as equipment lead time and availability. Not all of the suppliers offer the BYD Cube Pro battery modules, however any final product will adhere to the same strict safety and operating parameters, and will be aesthetically very similar (a containerized solution). In no case will Endurant be changing the transformers or inverters, so the interconnection will be unaffected.

The ESS Program agreement is for 10 years. The related Energy-Storage-as-a-Service (ESaaS) Agreement and associated Site Lease Terms are both 10 years. They are held between Linde, Inc and a special purpose entity that will be wholly owned by Endurant. In the unlikely event Endurant transfers the facility to another entity, Endurant will provide the Council with a written agreement confirming the entity responsible for complying with the Declaratory Ruling and assessment charges, including all appropriate contact information. At the end of the contract term, Endurant does not anticipate seeking other revenue mechanisms, and will remove all the system equipment and restore the Site to its pre-installation state.

A. SITE

The Project will be located at an approximately 80,000 square-foot industrial gas processing and supply facility on a 7-acre parcel, located at a site known as 1 Ucar Street in Suffield, Connecticut, owned by Praxair Inc. and shown on Figure 1 (the "Facility"). Please note that per the Town of Suffield Geographic & Property Information Application ('GIS Map') the plot ID is 97

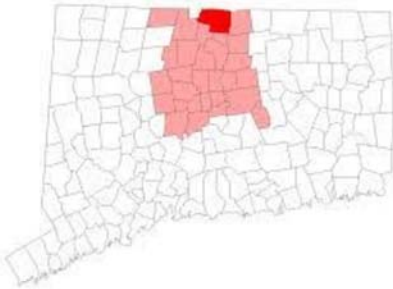
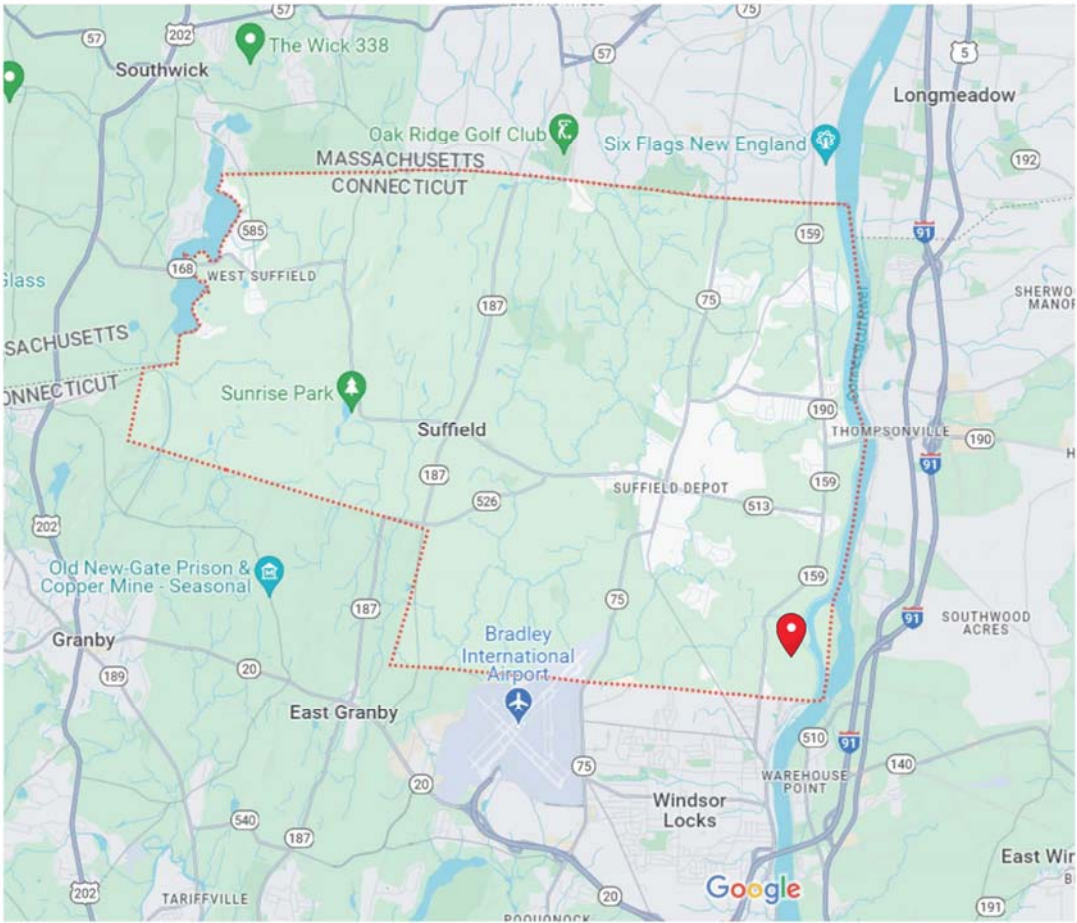
14 45 AC, location #50 Ucar St, owner Praxair, Inc. For the avoidance of doubt, where Endurant refers to 1 Ucar Street throughout this Petition, Endurant is referring to plot ID 97 14 45 AC.

The footprint of the Project, including setbacks, will be approximately 16,000 square feet, located on a paved portion of the developed property (the "Site"). This represents the limit of the disturbance required to construct the BESS, although there will be temporary requirements for items such as the parking of equipment transportation vehicles and any cranes required to transfer the equipment from the transportation vehicles to their installed location. The Facility is zoned as I- Industrial. The Site is on a developed industrial property. The property is bordered to the north by Ucar Street and woodland, to the east by woodland, to the west by East Street South, and to the south by the rear side a large wholesale grocery facility. There is a railroad running along the south-west boundary of the Site. The Connecticut River is 0.4 miles away, bordered by the Suffield Locks canal.

More precisely, the Project will be developed at a Site off Ucar St, close to the junction with East Street South. The BESS containers will be installed on concrete pads within a fenced area (eight feet high) that includes the required setbacks which are dictated by the OEM, and are designed to allow for safe operations and maintenance access. The Fire Department can access the Site without the need to travel through the host Facility. Figure 2 depicts plan and elevation views of the Site. Figure 3 depicts the Project equipment overlain on an aerial view, and ground level views of the Facility and Site location.

Figure 4 presents the Site boundaries and the Parcel Boundaries. The "Site" is defined as the area of the host parcel that is to be leased by Endurant and is identified by the BESS Facility perimeter fencing. No rights-of-way, access or easements are associated with the proposed Site. The final dimensions may vary slightly from what is shown depending on utility requirements.

Unless an extension has been agreed to, when the Project reaches the end of its commercial life (anticipated to be 10-years), Endurant will remove all the system equipment and restore the Site to its pre-installation state. The property owner has not expressed any concerns or requested any requirements related to decommissioning or Site restoration. Section V.G of this Petition details the decommissioning process and planning.



	Battery Energy Storage System Praxair, Inc. 1 U Car Street Suffield, Connecticut	Figure 1 Site Location
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Image source: Google Earth

	<p>Battery Energy Storage System Praxair, Inc. 1 U Car Street Suffield, Connecticut</p>	<p>Figure 2 Site Plan and Ground Views</p>
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PRAXAIR SITE PLAN

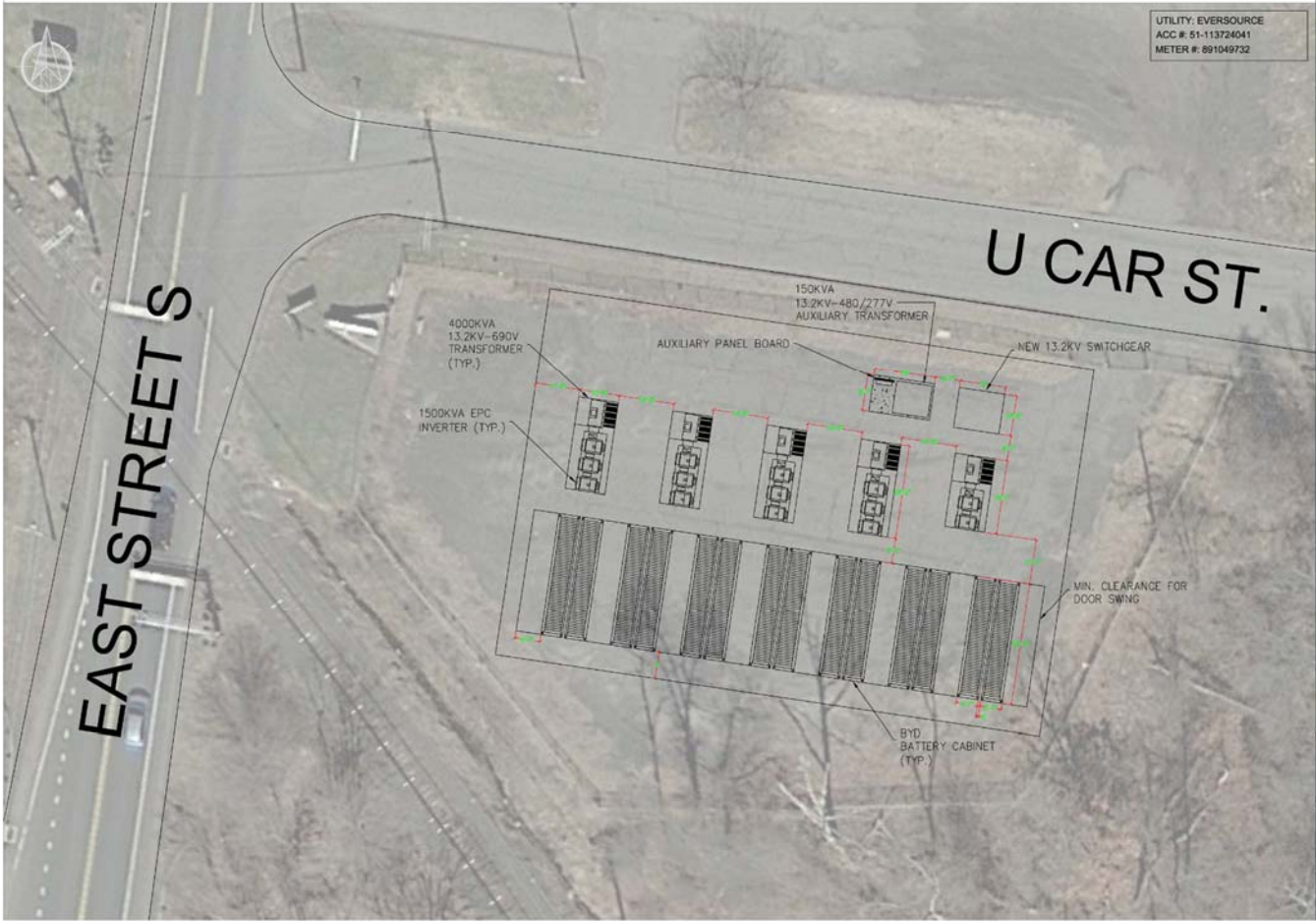
PLANT AGGREGATE: 18.13MW/36.26MWH

SCALE: 3/32"=1'-0"

endurant 
 800 W 37TH STREET, 16TH FLOOR
 NEW YORK, NY 10018

UTILITY: EVERSOURCE
 ACC #: 51-113724041
 METER #: 891049732

DE
 ENGINEERS
 OF ENGINEERING SERVICES
 100 W 30TH STREET, 10TH FLOOR
 NEW YORK, NY 10001

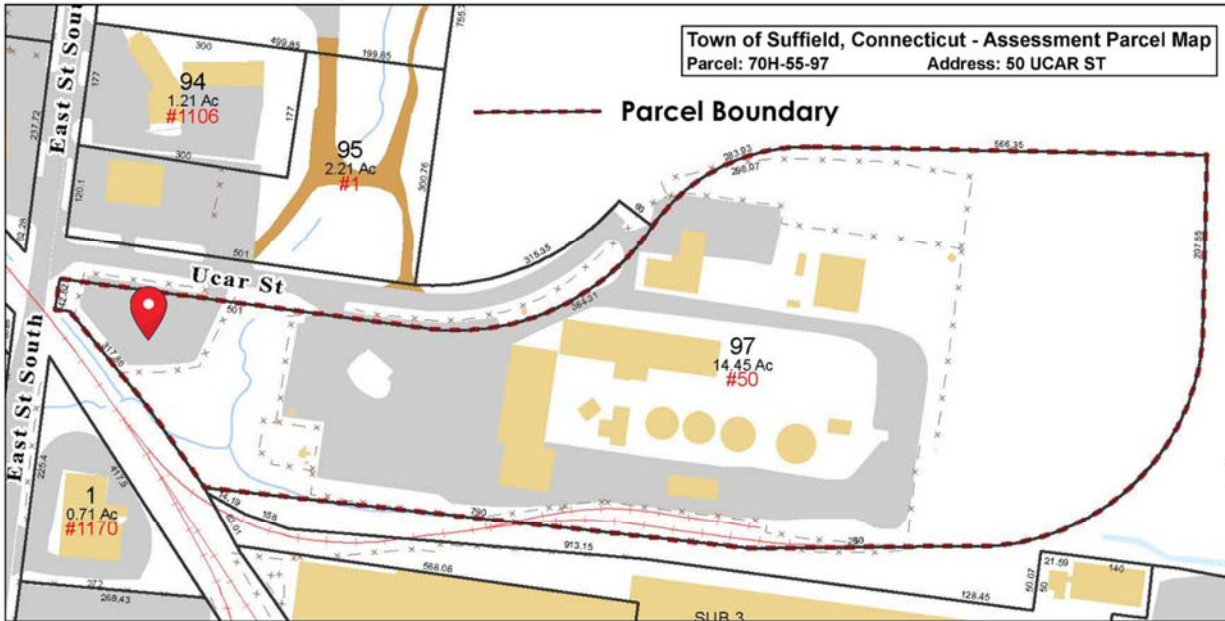



PROJECT:
 BATTERY ENERGY STORAGE
 PRAXAIR
 (18.13MW / 36.26MWH)

ADDRESS:
 1 U CAR STREET,
 SUFFIELD, CT, 06078

DRAWING TITLE:
 ELECTRICAL GENERAL
 ARRANGEMENT PLAN

DATE: 01/20/2023 DRAWN BY: E-1



	<p>Battery Energy Storage System Praxair, Inc. 1 U Car Street Suffield, Connecticut</p>	<p>Figure 4 Parcel and Site Boundaries</p>
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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 BYD Cube Pro 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 feedback and supply chain constraints, but the core technology presented in this Petition will be the same.

The Project term is for 10 years. The battery capacity will degrade naturally, but Endurant will not undertake augmentation or capacity maintenance during that timeframe. Endurant currently has no plans to do so, however it is theoretically possible that in year 10, the relationship between the Host Site and Endurant could be extended (there is a clause in the contract allowing for this scenario) in which case the battery cells could be replenished with newer cells to increase the system’s capacity. This could only be done if both the Host Site and Endurant wished to extend the relationship. The economic viability of doing so 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. The transformers, inverters and switchgear are designed for a 20-year commercial life as is standard.

C. INTERCONNECTION

The Project is in the early stages of the interconnection process with Eversource. The Project filed an interconnect request on March 15, 2023, with Eversource and has been assigned project number INT-76768. Due to its size, an Affected System Operator study which includes review by ISO-NE is required at both transmission and distribution levels. The agreement with Eversource to undertake the study was executed on August 7, 2023 and is expected to take between 9 and 18 months to complete.

The Project will electrically interconnect to the utility's 13.8kV distribution feeder 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, in partnership with its subcontractor, Berkshire Environmental Consultants, has worked with the Town of Suffield to provide information about the Project and to discuss permitting, safety and other feedback. Endurant met with the Town of Suffield Director of Planning and Development, Engineer Liaison, to present a Project overview and discuss permitting, wetlands, the Connecticut River Conservation Zone and floodplain locations, confirm building electrical and mechanical permit requirements and fire plan review. One point was raised by the Director during the meeting, if fencing within 50-feet of a public road should be see-through, and not exceed 4 feet in height. He noted that this is designed to protect residential areas, however, the requirement also applies to this Industrial zoned property.

Suffield Zoning Map with the Project identified is shown in Appendix C. If the Project is approved, only municipal permits will be needed for the Project's construction and operation, including a building permit, mechanical permit and electrical permit. These will be held by Endurant DB, LLC, as Engineering, Procurement & Construction (EPC) contractor.

Endurant shared location, site layout and equipment specification information with the Chief of Suffield Fire Department and the Suffield Fire Marshal, and at their request had follow-up calls with the Suffield Fire Marshal to discuss the fire safety systems of the BESS, the detection and fire alarm systems and incident response. The Suffield Fire Station is staffed by career fire fighters twenty-four hours a day, seven days a week, but also relies heavily on volunteer members. The Suffield Fire Marshal confirmed that the Fire Department has no concerns about the proposed BESS. The need for clear signage and contact information for emergency contacts at both Endurant and Praxair, Inc. was agreed. It was noted that this information is part of Endurant's Emergency Response Plan. It was also noted that the Suffield Fire Department accepted Endurant's offer to provide training and education on BESS.

The Fire Marshal input was used in the development of emergency plans and identification of fire safety equipment for the Project. Endurant will continue to seek input from the Fire Department through the design-build stage, including ensuring clear disconnection signage as discussed, providing secure fenced area access, emergency disconnection equipment and planning for water access. 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 Suffield Fire Department to develop and provide training resources.

A letter describing the Project was sent to the Suffield First Selectman on November 22, 2023. Detailed logs of the contacts with local authorities about the Project are presented in Appendix B. The Suffield Zoning Map with the Project identified is shown in Appendix C. Appendix C also provides a photolog of the Site, with directional views of key site components.

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), including the Town of Windsor Locks and the Town of Enfield, which have a boundary not more than 2,500 feet from the Site.⁴ 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 \$18.8 million. Costs will be recouped through payments made from the State of Connecticut EStS 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.

IV. 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.

⁴ 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...".

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 or HFC-410a refrigerant. Both cooling systems are closed loop with no emissions released during routine operations. R134a and R410a are non-ozone-depleting hydrofluorocarbons (“HFC”). They were among the first refrigerants developed to replace CFCs which are ozone-depleting substances and have 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 and temporary. If necessary to control fugitive dust, water spray will be used during construction.

B. WATER QUALITY IMPACTS

1. Wetlands and Watercourses

The Site is not located in a mapped wetland delineated area, as determined by the wetland soil map provided by the Town of Suffield 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 CT Geodata Portal Inland Wetland Soils Map, identifying the Project location, is 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, private well parcels, or Drinking Water Watersheds at the Site, as shown in the Aquifer Protection and Well Parcel Map in Appendix C. The CT DEEP Water Quality Classification Map, shown in Appendix C, indicates that the Groundwater Class at the location of the Site is Class GA. Class GA designated uses are existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically-connected surface waterbodies.

The Project has no normal operating processes that will impact groundwater or surface water. Battery components are contained within weather-resistant containers which are specifically designed to prevent any precipitation contact. 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, (BESS fires typically take several hours to burn themselves out) and to use water to control impacts on adjacent structures to prevent spread. Firewater generated would be comparable to water generated during routine fire response of manufacturing buildings and electrical equipment. If water were to come into contact with the battery cells there is no evidence that it becomes a hazardous material. 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 the Project location is not within the 100-year Flood Zone. This determination was confirmed by the Suffield Town Planner. The FEMA flood hazard area is 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. Typical cut and fill volumes are approximately 1,200 cubic feet. The soil will be tested before construction and any remediation or disposal will follow federal, state and local requirements. 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 change outs 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 could result in vehicle fluid leakage 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 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		
<i>Product</i>	<i>Use</i>	<i>Approx. Quantity On-Site</i>
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
SITE PREPARATION AND CONSTRUCTION		
<i>Product</i>	<i>Use</i>	<i>Quantity On-Site</i>
Construction Vehicle Fluids	Fuel, oil, hydraulic and other oils used in site vehicles, and heavy equipment used during installation.	Variable

*Current design includes dry type transformers, which are air cooled, without the use of oil. Oil transformer information is provided for information and completeness, in unlikely case the design is changed.

E. WILDLIFE AND HABITAT

The CT DEEP Natural Diversity Database (“NDDB”) maps general locations of Connecticut 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, nor is it in a critical habitat area. See figures in Appendix F. The Project Site is not in or adjacent to any of the State’s Protected Wildlife Management Areas. Given that the Project is not located within a NDDB area, and it is not expected to impact any state-listed species, consultation with CT DEEP’s NDDB concerning the construction of the Project was not required.

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. 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 #307 – Urban Land. The General Soil Map of Connecticut (1978) indicates it is map unit #27,

Elmwood-Buxton-Scantic: Brownish and reddish, nearly level to gently sloping, deep, moderately well drained and poorly drained soils with a silty or clayey substratum; on terraces.

None of the soils at the Site are mapped as prime farmland or farmland soils of statewide importance, nor are there any forested areas on Site, therefore there is no 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 (“Cavanaugh Tocci”) 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 generate sound when charging and discharging, and when the air conditioning system is in use. The scenario takes the cooling fans into account. Neutral conditions (‘standby mode’) do not generate noise. The sound assessment was modelled on the ‘worst-case’ scenario and examined noise levels from all the equipment of the proposed system, including the batteries, the inverters and the transformers.

Based on Cavanaugh Tocci’s review of the Project description and the BESS and inverter noise study reports, sound produced by the proposed BESS Project will comply with the most stringent requirements of the state and local noise regulations. Furthermore, Cavanaugh Tocci 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 sited on an existing parking lot at the entrance to a 7-acre parcel, with an existing 80,000 sq ft gas processing and storage facility, which is in a heavy industrial setting. The Project will be enclosed in a securely fenced area at the Facility's western end. The Project will be visible from East Street South and Ucar Street. The Suffield Director of Planning and Development, Engineer Liaison did not suggest any additional screening in reviewing the Project, he just noted the Town’s fencing height and visibility requirements. As previously discussed, fencing slats could be used to screen the Project equipment, however, a final determination would be made in conjunction with the Planning and Zoning Department at the permitting stage.

Since this Project is being added to an existing parking lot in an existing industrially developed property, in a heavy industrial area, 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. No on-site lighting is required, so there will be no change in the visual impacts related to lighting.

The Site is not in or adjacent to any of the State’s Protected Wildlife Management Areas. The Windsor Locks Canal State Park Trail occupies a narrow strip of land between the western shore of the Connecticut River and the canal. The Project is approximately 0.6 miles from the canal trail, and not visible from the trail. The Project location is approximately 1.0 miles from Pesci Park, 1.37 miles from Noden Reed Park, 1.4 miles from the Windsor Locks Recreation Department and Fields, 1.45 miles (across the Connecticut River) from Angelo Joseph Sferrazza Memorial Park in Enfield, 1.92 mi from Spring Park, 1.95 miles (across the Connecticut River) from Osborn Field in Enfield and 3.2 miles from Stoney Brook Park in Suffield. The Project is not visible from any of these locations, and none of these natural resource areas will be impacted by the proposed Project.

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 is one NRHP property within ½ mile of the Site, and three NRHP-listed properties within one mile of the Project. These properties are presented below in Table 2, and mapped in the figure presented in Appendix H.

Table 2 – National Register of Historic Places

NRHP Property	Distance from Site
Enfield Canal	0.10 mi
Bridge #455	0.67 mi.
Windsor Locks Passenger Station	1.03 mi
David Phinney House and Barn	1.25 mi

Based on the distances to NRHP properties, the limits of the Project scope and intervening structures and wooded property, Endurant deems that there will be no impact on historic places,

and therefore a Project Notification Form to the State Historic Preservation Office has not been submitted. Further, the height of the Project will not exceed the height of nearby buildings.

V. 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 approves the Project. Following these key milestones, Endurant anticipates that by Q4 2024, advanced engineering design work will be completed, final permits will be secured, and equipment purchase orders will be placed. On-site activities will begin by Q2 2025. On-site construction is anticipated to take no more than six months. Endurant’s construction teams and subcontractors typically work from 8 AM to 5 PM, Monday to Friday. Occasionally, specialist equipment is required (such as a crane to lift the containerized batteries from the flatbed truck upon which they will be transported) which might require work to be done on-site outside these hours, from 7 AM to 6 PM.

The Project will require minimal construction or disruption to the existing Site since the Site is already developed. 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 excavations will be minimally disruptive and will be coordinated with the Site host to minimize operational impacts. A small amount of tree clearing, along with undergrowth will be required to develop the Site: the connection to the local grid needs conduit for a 13kV cable to run from the Site approximately 115 feet southeast to the edge of the existing substation in the south-western corner of the adjacent parking lot, as illustrated in the arial image below:



Endurant will minimize the impact to trees and undergrowth to the extent Endurant reasonably can.

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 shortly prior to or during the 2025 ESS Program season which is scheduled to start June 1, 2025 and run through September 30, 2025.

C. TRAFFIC/PUBLIC TRANSPORTATION

During the construction phase of the Project, there will be a short-term slight increase in the local traffic, due to the number of construction vehicles and equipment coming onto the Praxair, Inc. property from East Street South. The driveway and parking lot on which the Project will be sited are large enough to accommodate the staging and parking of any construction vehicles or heavy equipment needed for site work and construction activities. On-site traffic controls will be utilized as required to minimize any impact to typical traffic patterns and the Town of Suffield 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.

Connecticut Route 159, a State Highway known as East Street South in Suffield is directly to the west of the Property. East Street South is approximately 90 feet from the Project. Endurant believes that the distance between the highway and the Project precludes any highway related impact to the battery system or battery incident impact to the highway system.

There is a Connecticut Southern (CSO) Railroad Line that runs from northwest from Windsor Locks to Suffield Junction. This rail line crosses Route 159 to the west of the proposed Project Site and is adjacent to the Facility's south/southwestern property boundary, approximately 50 feet from the Site equipment. There is a spur line from the main track to the Praxair, Inc. facility to the east of the Site. The distance between the railroad tracks and the Project is such that a theoretical train impact to the battery system (for example a derailment) or battery incident impact to the railway (such as a major fire) does exist, as it would for any static adjacent infrastructure. To ensure that the appropriate safety measures are adhered to, such as an incident at the Site being appropriately reported to the rail line operator, Project information was provided to the Safety and Compliance Manager of CSO's parent company Genessee and Wyoming Railway on November 29, 2023. The Safety and Compliance Manager has not raised

any concerns. On December 6, 2023, Project Information was provided to CSO’s General Manager, who shared it with CSO’s AVP Engineering who confirmed they had no comments. Endurant will continue to work with CSO and ensure that the Emergency Response Plan is shared and reviewed with CSO, and will incorporate any actions required by CSO in relation to emergency response.

D. FAA DETERMINATIONS

There are several aviation facilities within a 5-mile radius of the Project. These facilities and distances from the Project are identified in Table 3 below.

Table 3 – Aviation Facilities – 5 Mile Radius

Facility Code	Facility Name	Type	Location	Distance from Project (miles)
CT23	Della Heliport	Heliport	Enfield, CT	1.26
	Bradley International Airport	Airport	Windsor Locks, CT	2.0
7B6	Skylark Airpark Airport	Airport	Warehouse Point, CT	3.15
CT35	Hamilton Standard Heliport	Heliport	Windsor Locks, CT	3.36
CT87	Bootleggers Seaplane Base	Seaplane	Enfield, CT	3.63
CT50	Marks Heliport	Heliport	East Granby, CT	4.0
CT19	Laurie Field	Airport	Hazardville, CT	4.7

The FAA 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 Part 77 were not exceeded for either scenario. These Notice Criteria Tool outputs are presented in Appendix I.

Notwithstanding this determination, Endurant will provide notice to these aviation facilities prior to the use of the construction crane. This notice will ensure that the facilities are 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 ESS Program call windows (please note whenever the ESS Program is active, it will take priority - it can call on the asset to dispatch between 12pm and 9pm any day of the week), the BESS will

discharge, typically for 2-3 hours between 3:00 p.m. - 8:00 p.m. The shortest time for the battery to be discharged would be over 2 hours, when triggered by a request from the ESS Program Administrator. This will fully deplete the battery. During the June - September period, the BESS will charge at night, typically from approximately 11:00 p.m. - 6:00 a.m. The minimum amount of time it could theoretically take for the battery to fully recharge is 2 hours, however in reality the time taken 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. The shortest time for the battery to be discharged will be over 2 hours - specifically, this will be in the summer when it is participating in the ESS Program. This discharge will be triggered by a request from the ESS Program Administrator and will fully deplete the battery. At these times, when the ESS program is not active, Endurant will be discharging to reduce Praxair, Inc.'s load at peak times so discharge can therefore be to a maximum of the facility load at those times - there might therefore be residual charge in the BESS after discharge. Praxair, Inc.'s processing operations are performed on a '24/7' basis, minimizing differentiation between weekdays and weekends.

The BESS is not required to reserve any battery storage capability for backup power, although it can provide backup power to the Site host. The amount and duration of backup power will depend on the battery's state of charge when the outage occurs. Per UL and utility interconnection rules, the system will disconnect from the grid ("island") in the event of a power outage, and therefore will not export electricity into the grid at such a time - any charge will be used by Praxair, Inc. While the BESS 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 ESS Program rules. While it is operating, the battery system will be remotely monitored 24/7. The Project will be equipped with Battery Management Software⁵ (“BMS”) that uses supervisory control and data acquisition systems to initiate automated procedures or responses by personnel.

The Project term is 10 years. The battery capacity will degrade naturally during this time, and Endurant will not undertake augmentation or capacity maintenance unless market and economic conditions change significantly, to make that option desirable. Endurant currently has no plans to do so, however it is possible that in year 10, the battery cells could be replenished with newer cells to increase the system’s capacity. This could only be done if Praxair, Inc. and Endurant both wished to extend the relationship and agreed to trigger the clause in the contract to do so. The economic viability of doing so 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, BESS 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 ESS PROGRAM season to ensure the system will be fully available for that season-year.

⁵ Also known as a “Battery Management System”.

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, as well as visual inspection of system components and ancillary structures, such as the fencing enclosure, to ensure integrity and to identify any areas for repair or attention. 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 as needed.

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.

A Site Decommissioning Plan has been developed and is provided in Appendix J.

H. SAFETY

1. Site Security & Safety

The battery system will be surrounded by an 8-foot-high security fence, with locked access. 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 are 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. Endurant's experience has shown that no additional deterrents for small animals such as birds or rodents are required.

2. *Electric and Magnetic Fields (EMF)*

Electric and magnetic fields ("EMF") at storage facilities are not a cause of concern to the industry, due to the fact that static fields are produced by the battery banks and DC cabling. Best practice is therefore driven by fire safety and installation health and safety requirements, not EMF.

During operation, 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; and 4) 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 less⁶. 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.

⁶ 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.

3. *Fire Safety*

Each battery system completes UL 9540A testing which is a destructive test method used for evaluating the thermal runaway impacts in a BESS and gathering data to assist in assessing or developing mitigation plans. Endurant would only consider deploying systems which have demonstrated no module-to-module propagation. The BYD Cube Pro is made up of 24 battery packs in 8 racks with 3 packs per rack, and with 114 cells per pack, and 8 rack-mounted BMS monitoring amongst other things voltage, state of charge and temperature. 9540A testing showed only 5 cells damaged during the test, confirming the design limits propagation within the module, demonstrating it will not propagate through the entire BESS nor an adjacent system. The test found no external flames, electrical events or explosive discharge of gases.

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

Battery Design – The Project will comply with the current National Electric Code and National Electrical Safety Code standards as well as the 2022 Connecticut State Fire Code Chapter 52- Energy Storage Systems. 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 battery safety standards, including NFPA 855, UL 1642, UL 1973, UL 1741 SA as well as IEEE 1547E. 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 propagation, extent of gassing, explosion, or fire. Endurant only considers deploying systems which have demonstrated no module-to-module propagation.

The BYD BESS is made up of 8 racks of 3 modules per rack and 114 cells per module. The 9540A testing showed only 5 cells were damaged during the test, confirming the design limited propagation within the module and will not propagate through the entire BESS nor adjacent BESS. The UL 9540 A BYD 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 or explosive gas levels were detected.

Detection and Alarm Systems – The BESS is equipped with combustible gas detectors to detect the most prevalent flammable/explosive off-gases from lithium iron phosphate (LFP) battery cells – hydrogen (H₂), carbon monoxide (CO) and methane (CH₄). 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 a confined space) given the system is vented thus preventing effective reduction of oxygen levels.

Battery Management System - 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 Suffield Fire Marshal to discuss fire response options and strategies, and ways that Endurant can support the Suffield Volunteer Fire Department, through information, training, and other resources. Life safety is the response priority, then the protection of adjacent properties. 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. Appropriate fire safety signage (conformant with NFPA 855) will be reviewed with the Suffield Fire Marshal and Suffield Volunteer Fire Department as part of the Fire Plan Review and posted at the Site. Additional signage to ensure clear communication of disconnects, protocols, and contact information will be reviewed with the Fire Marshal and Volunteer Fire Department and all requirements and recommendations will be followed.

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.

There is adequate space for staging and response activities including incident command.

A municipal hydrant is located 285 feet to the north of the Site, on the east side of East Street South. Additional discussion on access to water will continue with the Fire Department as part of the Fire Plan review process. Access to water was not raised as a concern by them at any point. As discussed above, water is used to cool adjacent areas to prevent the spread of fire. Neither water, nor any other fire suppressants (e.g., 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 areas 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 (H ₂)	48.013 %
Carbon monoxide (CO)	11.191 %
Carbon dioxide (CO ₂)	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 a standard operating procedure for Emergency Response and notifications in event of a battery fire or other event, which has been documented in our Emergency Response Plan (“ERP”). The ERP lists the procedures in place to prepare for and respond to an emergency at the 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 Suffield Fire Marshal and Suffield Volunteer Fire Department. A running record of changes and updates will be maintained with the plan. The ERP is provided in Appendix K.

The Project is remotely staffed, except for semi-annual routine maintenance activities when contractors are on-site, however it is continuously remotely monitored by a Remote System Operator. In the event of an emergency such as a fire, an Endurant employee would be available 24/7 by telephone and would consult with responders to provide system information useful in event characterization and response planning. A member of Endurant's team would be dispatched to the location as soon as possible (within 24 hours). An on-site member of the Praxair, Inc. team is designated as the BESS liaison and will be trained on the BESS and in emergency response protocols related to the facility. This liaison would respond immediately to the event and provide information and facilitate communication with Endurant staff. During an emergency response event, staff personnel and emergency responders will be automatically contacted.

VI. CONCLUSION

For the foregoing reasons, Endurant 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.