

DRAFT

**Petition No. 1579
KCE CT 9, LLC
2 Ella Grasso Turnpike, Windsor Locks**

**Staff Report
November 3, 2023**

Introduction

On June 13, 2023, the Connecticut Siting Council (Council) received a petition from KCE CT 9, LLC (KCE) for a declaratory ruling pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k for the construction, operation and maintenance of 5.0 megawatt (MW) alternating current (AC) battery energy storage facility (BESF)¹ located at 2 Ella T. Grasso Turnpike, Windsor Locks, Connecticut, and associated electrical interconnection (Petition or Project).

Pursuant to Regulations of Connecticut State Agencies (RCSA) §16-50j-40 on or about June 5, 2023, KCE notified the abutting property owners and Town of Windsor Locks (Town) officials, Town of Windsor² officials, state officials and agencies of the proposed Project. No comments were received.

On June 15, 2023, the Council sent correspondence to the Town and the Town of Windsor stating that the Council has received the Petition and invited the municipalities to contact the Council with any questions or comments by July 13, 2023. No comments were received.

Also, on June 15, 2023, pursuant to RCSA §16-50j-40, the Council notified all state agencies listed therein, requesting comments regarding the proposed Project be submitted to the Council by July 13, 2023. No comments were received.

The Council issued interrogatories to KCE on July 18, and September 26, 2023. KCE submitted responses to the Council's interrogatories on August 8, and October 19, 2023.

Pursuant to CGS §4-176(e) of the Uniform Administrative Procedure Act, an administrative agency is required to take an action on a petition for a declaratory ruling within 60 days of receipt. During a regular meeting held on August 3, 2023, pursuant to CGS §4-176(e), the Council voted to set the date by which to render a decision on the Petition as no later than December 10, 2023, which is the 180-day statutory deadline for a final decision under CGS §4-176(i).

On August 8, 2023, KCE filed a Motion for Protective Order (MPO) related to the disclosure of project costs, cost recovery mechanisms and energy pricing contained within the response to Council interrogatory No. 3 for the proposed facility, pursuant to CGS §1-210(b) and RCSA §16-50j-62(d), on the basis that it contains confidential, proprietary information. On August 17, 2023, the Council granted the MPO.

¹ CGS §16-50i(a)(3) - the Council has jurisdiction over energy storage facilities using any fuel throughout the state.

² The Town of Windsor is located within 2,500 feet of the proposed facility.

Public Act 21-53

Public Act 21-53, “An Act Concerning Energy Storage,” established a statewide goal to deploy 1,000 MW of energy storage in Connecticut by the end of 2030. It requires the Public Utilities Regulatory Authority (PURA) to develop programs for customer-side and grid-side energy storage systems connected to the electric distribution system and enables DEEP to issue requests for proposals for energy storage systems paired with renewable energy sources and stand-alone energy storage systems connected to the electric transmission or distribution system.³

Energy storage system is defined under CGS §16-1(48) as “any commercially available technology that is capable of absorbing energy, storing it for a period time and thereafter dispatching the energy.”

On July 28, 2021, PURA developed a nine-year electric storage program, the Energy Storage Solutions (ESS) program⁴, that is administered by the Connecticut Green Bank, Eversource Energy (Eversource) and the United Illuminating Company (UI). It offers performance incentive payments to residential, commercial, and industrial customers who host on-site battery energy storage systems as follows:

1. Behind the Meter (BTM): customer-side distributed resource that serves on-site load (paired or stand-alone) behind a customer meter; and
2. Front of the Meter (FTM): grid-side distributed resource that does not serve on-site load (paired or stand-alone) behind a customer meter.⁵

A paired BTM or FTM storage system has a separate input and output source. For example, a paired system could have a solar facility-generated input and a 23-kV electric distribution line output. A stand-alone BTM or FTM storage system has the same input and output source, such as a 23-kV electric distribution line. Among the technical requirements for storage systems in the ESS program is the capability of the system to provide backup power or island from the grid during outage events.

The proposed BESF is a stand-alone FTM system that was designed in response to the goals of the ESS program and KCE expects to participate in future procurements for battery energy storage systems.

Public Benefit

A “customer-side distributed resources” facility is defined under CGS §16-1(a)(34) as “generation of electricity from a unit with a rating not more than 65 MW at customer premises within the transmission and distribution system or a reduction in the demand for electricity at customer premises through conservation and load management. A “grid-side distributed resources” facility, is defined under CGS §16-1(a)(37) as “generation of electricity from a unit with a rating not more than 65 MW that is connected to the transmission or distribution system.”

The state Comprehensive Energy Strategy (CES) examines future energy needs and identifies opportunities to reduce ratepayer costs, ensure reliable energy availability, and mitigate public health and environmental impacts. CES Strategy No. 8(B) is “Integrate efficiency, storage, and renewables to meet peak demand.” The state Integrated Resource Plan (IRP) assesses the state’s future electric needs and a plan to meet those future needs. IRP Objective No. 13 is “Support the development of energy storage resources that can support the reliable integration of variable renewables and avoid fossil peaking generation.”

³ The interim goals of the program are 300 MW by year-end 2024 and 650 MW by year-end 2027.

⁴ <https://energystoragect.com/>

⁵ Energy Storage Solutions Program Manual, CT Green Bank, Eversource and UI, dated January 20, 2023, *available at* [https://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b64d/a3ee00544b1b1fc285258940006564b7/\\$FILE/ESS%20Program%20Manual_Updated%201.20.2023_CLEAN.pdf](https://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b64d/a3ee00544b1b1fc285258940006564b7/$FILE/ESS%20Program%20Manual_Updated%201.20.2023_CLEAN.pdf)

The proposed BESF is a grid-side distributed resource facility. It would benefit the state electric system by drawing energy from generation resources at times of low demand and subsequently injecting that energy back into the system at times of high demand. The proposed facility is designed to achieve the goals of the state Conservation and Load Management Plan, including, but not limited to, shifting energy demand and servicing system load. It would be located in the vicinity of Bradley International Airport (BDL) where energy demand shift and system load service is variable.

KCE would participate in the ISO-NE England, Inc. (ISO-NE) Forward Capacity Auction with the objective of securing a capacity supply obligation for the 2027 to 2028 Capacity Commitment Period and subsequent years. During 2026, KCE will participate in other available ISO-NE markets, such as the wholesale energy market and frequency regulation market subject to needs and market opportunities.

The Project would be remotely operated by KCE and would be dispatched according to market signals and opportunities, ISO-NE capacity supply obligation instructions, or other future contract obligations, as applicable.

Proposed Site

Pursuant to CGS §16-50x, the Council has exclusive jurisdiction over the BESF “site.” Under RCSA §16-50j-2a(29), “site” means a contiguous parcel of property with specified boundaries, including, but not limited to, the leased area, right-of-way, access and easements on which a facility and associated equipment is located, shall be located or is proposed to be located. The Council does not have jurisdiction or authority over any portion of the host parcel beyond the boundaries of the facility “site.” This includes portions of the host parcel retained by the property owner and portions of the host parcel the property owner may lease to third parties. Once a facility is decommissioned, the Council no longer has jurisdiction or authority over the “site.”

Under a lease agreement with the property owner, KCE proposes to construct the BESF on an approximately 0.51-acre site on an approximately 5.1-acre host parcel owned by John Barberino. The host parcel is located within a business/industrial zone (BUS-1) and is developed with approximately 1.6 acres of gravel parking area. The remainder of the host parcel contains regenerating forest with stormwater management features that drain to the south towards State Route 20. The facility would be located in the eastern portion of the host parcel and entirely on the gravel parking area.

The surrounding area consists of commercial development to the north and east, undeveloped land to the west, and Route 20 and Eversource electric transmission lines to the south. The nearest residential property line from the proposed facility site is approximately 947 feet to the southwest at 111 High Street.

Proposed Facility and Associated Equipment

The proposed grid-side BESF would consist of twelve, 2.752 MWh Sungrow battery storage units with a maximum export capacity of 5 MW AC. Each battery storage unit has a maximum energy storage capacity of approximately 2.752 MWh for a total maximum storage capacity of approximately 33.02 MWh.⁶ The BESF would be capable of providing a maximum of 20 MWh of electrical energy to the grid based on a 4-hour duration. Its recharge cycle would require a minimum of 4.67 hours based on 5 MW AC at the point of interconnection. Each battery storage unit consists of 48 modules with 64 battery cells per module.

Other equipment includes Two Sungrow SC3150-MV-US inverters each paired with a 5,000 kilovolt-ampere transformer; an auxiliary power skid with a 23-kV/480 V transformer; switchgear and a control house.

⁶ While the facility would be theoretically capable of storing up to 33.02 MWh of energy, the maximum discharge to the grid is proposed to be limited to 20 MWh due to electrical losses, to prevent a full depletion of the batteries and to address degradation losses over the life of the BESF.

The facility would disturb a 6,500 square foot area and be located within an approximately 161-foot by 138-foot compound surrounded by a 7-foot tall chain link fence. KCE would incorporate the existing gravel surface as part of the compound area. The control house is 10 feet long by 8 feet wide by 8.5 feet high. The battery storage units are approximately 30.6 feet long by 5.7 feet wide by 8.5 feet high and each includes, but is not limited to, batteries, a cooling system, and electrical equipment. The cooling system for each battery storage unit would include a fan; water pump; and a circulating water and ethylene glycol mix coolant.

The facility would be accessed from an existing driveway off of Ella Grasso Turnpike (Route 75) that extends to the compound. The driveway is within an existing easement on a portion of the abutting property at 8 Ella Grasso Turnpike. No new access would be constructed.

The only cut and fill would be associated with minor excavation such as concrete pad, fence post and utility pole installations as well as conduit trenching between the equipment pads. Approximately 350 cubic yards of earth movement would be required to construct the Project, and excess material would be hauled off-site if it cannot be reused at the site.

No blasting is expected to be required for the Project. The geotechnical report indicates that the site is largely sand and not expected to contain shallow bedrock.

The facility would interconnect to existing 23-kV electric distribution lines on Ella Grasso Turnpike. The proposed interconnection route would run overhead from the proposed facility to the east along the access route to Ella Grasso Turnpike. Three new poles approximately 39 feet above grade would be installed to accommodate the electrical interconnection.

Eversource's distribution impact study has been completed, and an interconnection agreement is anticipated to be completed in first quarter 2024.

By letter dated June 30, 2023, the ISO-NE Reliability Committee determined that the proposed Project would not have an adverse impact on the electric transmission system.

Construction of the BESF is expected to begin in late 2024 and would take approximately 12 months. Construction hours would be from 7:00 a.m. to 5:00 p.m. Monday through Friday.

Once operational, the facility would require planned maintenance visits twice per year and unplanned maintenance visits on as-needed basis.

At the end of the approximately 30-year service life, all BESF components would be dismantled and removed, and the site would be restored in accordance with a Decommissioning Plan.

Environmental Effects and Mitigation Measures

Air and Water Quality

The facility would not require a DEEP Air Permit. No hazardous air emissions would be produced during the operation of the facility.

Operation of the facility would not consume water. There are no known wells on or in the vicinity of the site.

The site is not located within a Federal Emergency Management Agency-designated flood zone nor within a DEEP-designated Aquifer Protection Area.

The nearest wetland is located about 73 feet to the southwest of the proposed fenced compound. Field surveys were completed on November 17 and December 15, 2022, and April 4, 2023. No vernal pools were identified

on or proximate to the site. The proposed Project would be constructed consistent with the *2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control*. Specifically, KCE would install approximately 140 linear feet of silt fence near the southwestern corner of the compound are along the downstream edge of the existing gravel base.

The proposed transformers associated with the battery storage units would be filled with 100% biodegradable FR3 oil and would not have secondary containment. The transformers would include low oil level alarms. The auxiliary power transformer would also be filled with FR3 oil and have a containment system on the auxiliary power skid.

A Spill Prevention Control and Countermeasures Plan has been developed that takes into account all three transformers.

Pursuant to C.G.S. §22a-430b, a DEEP Stormwater Permit is required for any disturbance greater than 1 acre. The construction limit of disturbance for the proposed facility is approximately 6,500 square feet, therefore the project would not require a DEEP Stormwater Permit.

The Project would utilize an existing gravel parking area, and no new impervious surfaces are proposed. Thus, pre-development and post-development peak rates of stormwater runoff would be maintained without the need for new stormwater detention measures.

Forests and Parks

No trees six inches diameter or greater are expected to be removed to construct the proposed Project.

The nearest state park is the Windsor Locks Canal State Park Trail (WLCSTP) located approximately 2.4 miles northeast of the site. The proposed facility is not expected to be visible from WLCSTP due to the distance.

Scenic, Historic and Recreational Values

No historic or archeological sites within a one mile, SHPO-requested radius of the site would be impacted by the proposed Project. A Phase 1A Report indicated that there is one property listed on the National Register of Historic Places (NRHP) located approximately 0.9 mile to the west of the proposed site: the Benomi Case House (BCH) located at 436 Rainbow Road in Windsor. The BCH would not be visually impacted by the proposed Project due to the distance from the site.

By letter dated July 26, 2023, SHPO indicated that no historic properties would be affected by the proposed Project, and no additional archaeological investigations are warranted.

The nearest publicly-accessible recreational area is the Rainbow Reservoir Boat Launch, located approximately 1.5 miles west of the proposed site. The Project would not be visible from this area.

The nearest scenic road is a portion of South Main Street (Route 75) located approximately 3.9 miles north of the proposed site in the Town of Suffield. The Project would not be visible from this road.

The site is within a developed commercial and industrial area. The Project would be visible from the rear of 8 Ella Grasso Turnpike; however, due to topography and the recessed elevation of the site, it would not be a prominent visual feature. Existing buildings would obstruct the view of the facility from Ella Grasso Turnpike. The facility is not expected to be visible from the nearest residence located on the opposite side of Route 20 at 111 High Street due to the higher elevation of Route 20.

Fish, Aquaculture and Wildlife

The Project area is not located within a DEEP Natural Diversity Database (NDDDB) buffer area. KCE would install a perimeter fence around the facility that would be secured to the ground to deter small wildlife from entering the proposed facility compound.

The northern long-eared bat (NLEB), a federally-listed and state-listed Endangered Species occurs in Connecticut. However, there are no known occurrences in Windsor Locks.⁷ Additionally, only brush vegetation is expected to be removed during construction rather than mature trees.

Agriculture

Soil at the site is classified as urban land complex soil. It does not contain any prime farmland soils.

Public Safety

Noise

The primary sources of equipment noise for the proposed Project are the 12 battery storage units and the 2 inverters.

A noise analysis determined that noise from the operation of the facility would be no greater than 34 dBA at residential property boundaries and 63 dBA at commercial property boundaries. Thus, the operation of the proposed BESF would meet DEEP Noise Control Regulations.

Construction noise is exempt per DEEP Noise Control Regulations.

Electric and Magnetic Fields

The existing transmission lines to the south and the existing distribution lines along Route 75 are the dominant sources of electric and magnetic fields (EMF). The proposed electrical interconnection is not expected to create additional EMF at the property boundaries beyond existing conditions.

Security

The facility would be monitored on a 24/7 basis by a remote operations control center to detect abnormalities in operation. It includes extensive safety control systems, including both automatic and manual shutdown mechanisms that comply with pertinent engineering standards. If operational abnormalities occur, the BESF can be remotely shut down and emergency responders can be notified if necessary.

The proposed site would comply with the Council's White Paper on the Security of Siting Energy Facilities. Security measures include, but are not limited to, a locked security fence and recording security cameras.

The BESF would be enclosed within a 7-foot tall chain link fence that complies with the requirements of the National Electrical Code (NEC).⁸

⁷ <https://portal.ct.gov/-/media/DEEP/NDDDB/NoLongEaredBat-Map.pdf>

⁸ Section 110.31 of the National Electrical Code (NEC), 2020 Edition notes that for over 1,000 Volts, "...a wall, screen, or fence shall be used...A fence shall not be less than 7 feet in height or a combination of 6 feet or more of fence fabric and a 1 foot or more...utilizing barbed wire or equivalent."

The fence would be about 774 feet from Ellas Grasso Turnpike to the west, about 38 feet from the abutting property line to the north, about 90 feet from the abutting property line to the east, and about 47 feet from the abutting property line to the south.

The site will have a locked gate and limited access for authorized personnel only.

Emergency lighting would be installed at the BESF. Visual impacts associated with emergency lighting would be mitigated by existing vegetative buffers and site topography.

Fire Protection

KCE developed an Emergency Operations Plan (EOP) for the BESF. KCE's EOP provides guidance on procedures to address a fire or other abnormal emergency conditions at the facility.

The BESF would be designed in accordance with the National Fire Protection Association 855 – Standard for the Installation of Stationary Energy Storage Systems (NFPA 855). Each battery storage unit would be equipped with an exhaust ventilation system per NFPA 69 that would remove flammable gases released during a potential battery failure before explosive limits could be reached. This would consist of two exhaust fans per battery cabinet.

Each battery storage unit would also contain two heat detectors; two smoke detectors; and two combustible gas detectors for fire protection and to protect against thermal runaway. In the event of fire detection via these sensors, the fire alarm panel would send a signal to the central station which would then be relayed to the local fire department.

In the event of fire detection via smoke, heat or gas detectors, all battery racks would electrically disconnect from the system, and the fire alarm control panel would send a signal to the central station which would then be relayed to the location fire department.

Each battery unit would also be equipped with a dry sprinkler system per the manufacturer. After the power is shut down, the fire department could connect a tank truck to the system outside the battery storage unit and pump water into the sprinkler system for fire suppression.

However, current guidance from the International Association of Fire Chiefs (IAFC) suggests that fire events should be allowed to burn out in a controlled, contained manner while nearby resources are monitored and protected using water as a proactive cooling agent exterior to the battery storage units. Thus, KCE believes that containment of any fire until it is exhausted and use of water on surrounding structures to ensure containment of the fire is a best practice rather than operating the pre-installed sprinkler system.

In the event of a fire that includes a battery burst/rupture, a study for the New York State Energy Research and Development Authority notes that decomposition products or gases could potentially emit toxic fumes similar to that of fires of plastic materials such as sofas, mattresses or office furniture. It is not anticipated that evacuation would be necessary in the event of such an event, but such decision would be subject to the discretion of the local fire marshal.

KCE will continue to coordinate with local emergency responders, including the Town and BDL, to refine the emergency response plan and provide training to local responders prior to construction.

Aviation Safety

The nearest airport is BDL located approximately 1.5 miles north of the facility site. KCE received a Determination of No Hazard to Air Navigation from the Federal Aviation Administration (FAA) for the

proposed facility on May 30, 2023. On July 17, 2023, KCE received a Determination of No Hazard to Air Navigation from FAA for the use of a temporary crane during construction of the Project.

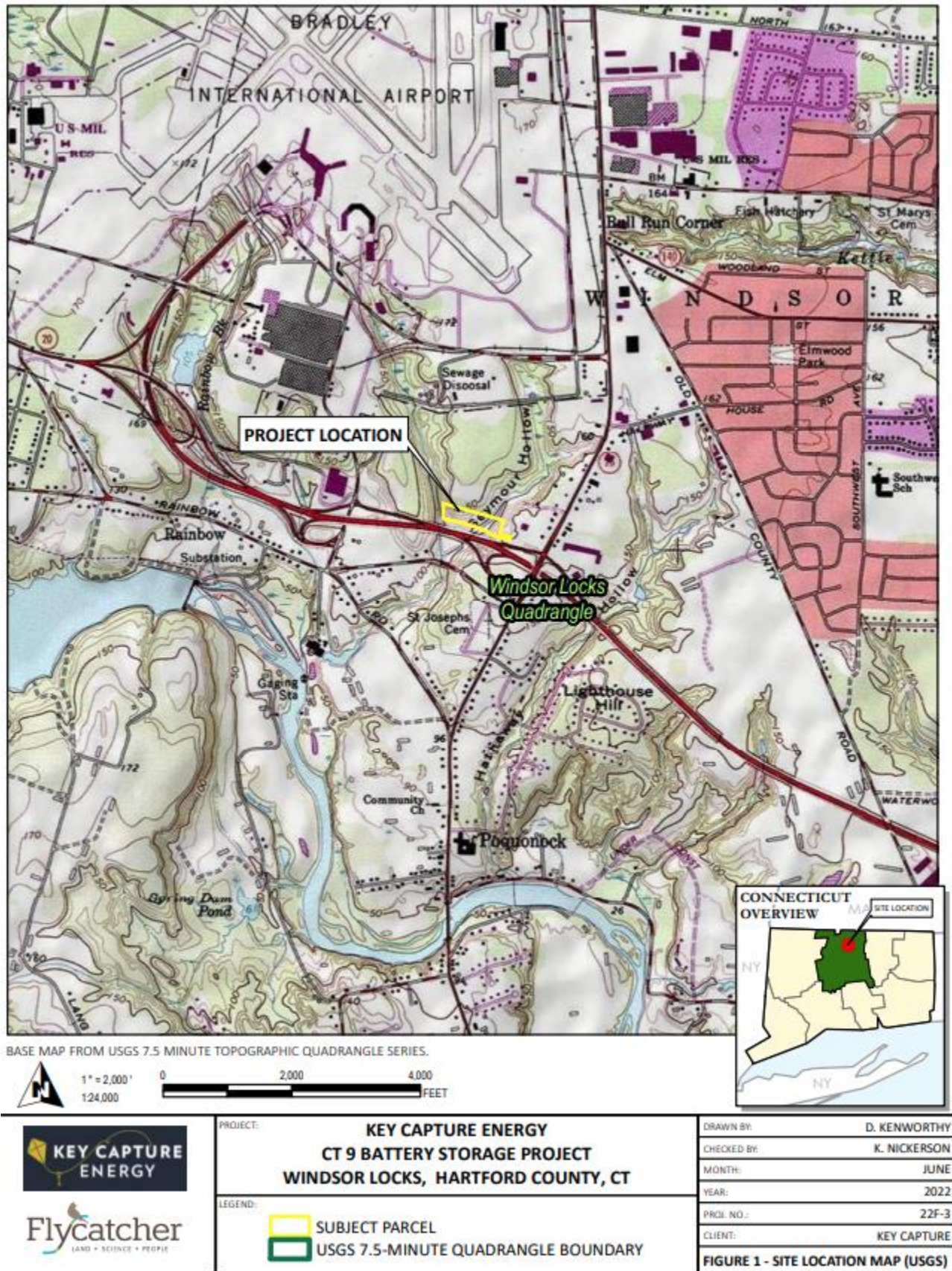
Conclusion

The BESF is a grid-side distributed energy resource with an output capacity of not more than sixty-five megawatts, meets air and water quality standards of the DEEP, and would not have a substantial adverse environmental effect. The proposed Project would further the State's energy policy by integrating storage to meet peak demand and support the reliable integration of variable renewable resources.

If approved, staff recommends the following conditions:

1. Approval of any Project changes be delegated to Council staff;
2. Submission of a final Spill Protection Control and Countermeasures Plan prior to commencement of construction; and
3. Provide a copy of the final Emergency Operations Plan to local emergency responders prior to facility operation, and provide emergency response training.

Site Location



Host Parcel – Existing Conditions



Proposed Site Layout



LEGEND

-  HOST PARCEL
-  INTERCONNECTION EASEMENT
-  UPLAND DRAINAGE
-  DELINEATED INTERMITTENT STREAM
-  DELINEATED STREAM BANK
-  DELINEATED WETLAND BOUNDARY
-  DELINEATED WETLAND
-  DELINEATED PERENNIAL STREAM/RIVER
-  SECURITY FENCE
-  BATTERY STORAGE CONTAINER
-  EDGE OF PAVEMENT
-  SWITCHGEAR
-  EQUIPMENT PAD - PCS
-  EQUIPMENT PAD - AUX
-  PROPOSED INTERCONNECTION ROUTE
-  EQUIPMENT PAD - OTHER