BEALS AND THOMAS

October 2, 2025

Wendell Conservation Commission
c/o Mary Thomas, Conservation Agent
9 Morse Village Road
Wendell, Massachusetts 01379

Via: Federal Express and Email to concom@wendellmass.us

Reference: Response to Comments
Wendell Solar PV
DEP File No. 325-0044
0 Lockes Village Road
Wendell, Massachusetts
B+T Project No. 3434.01

Dear Commissioners:

On behalf of the Applicant, Wendell Solar, LLC, Beals and Thomas, Inc. (B+T) respectfully submits this response to comments letter to address various questions raised by the Town Engineer via email on August 1, 2025, Conservation Commission at the public hearing on August 5, 2025, during the site walk with municipal boards on September 5, 2025, and at the Conservation Commission hearing on September 9, 2025 for the Wendell Solar PV project (the Project) located at 0 Lockes Village Road in Wendell, Massachusetts (the Site).

In addition to the Request for Amended Order of Conditions submitted to the Conservation Commission (the Commission), the Applicant has also submitted a Request for Amended Special Permit and Site Plan Approval to the Town of Wendell Planning Board (the Board). The Applicant attended the first Planning Board public hearing on September 29, 2025. The Applicant anticipates the eventual issuance of a revised plan set to the Commission and the Board as the public hearings progress. These documents will also be provided to the Board of Health (BOH) in a forthcoming Battery Energy Storage System Permit Application.

Noise Impacts

Noise generated by the battery energy storage system (BESS) is not continuous and the system would generally be operating at a lower noise level unless the BESS system is discharging or in the process of recharging. An acoustic analysis would typically be conducted for constant noise, which is not anticipated. B+T prepared an Acoustical Exhibit utilizing information from the manufacturers cut sheets for the BESS and inverters, which are included herein, to determine the approximate sound attenuation at various distances. Based on the initial review, a sound wall enclosure will likely be necessary for all four sides of the BESS area to ensure that there is no perceptible increase in sound at the property line and wetlands.

The Applicant intends to submit a revised site plan set depicting the proposed noise barrier enclosure including anticipated materials and dimensions. In the interim, please see the enclosed Acoustical Exhibit dated October 2, 2025, depicting the approximate sound band contours at various distances from the proposed electrical equipment. Please note that the exhibit depicts the BESS area shifted approximately 50' to the east and a proposed sound wall on all four sides of the BESS area. These edits will be memorialized in the Applicant's forthcoming revised plan set.

The Applicant and Landowner have indicated that mowing of the array area will occur infrequently, likely three or four times per year, during normal business hours, and there is the potential for using sheep to maintain the grassed areas within the array area instead of mowing. The Applicant is amenable to providing the Commission with a formal Landscape Maintenance Plan as a Special Condition of Approval.

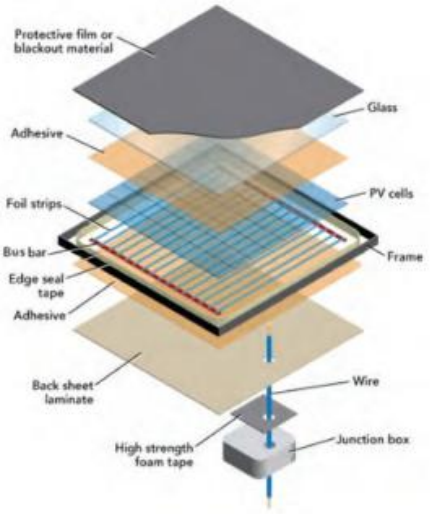
Health and Safety

Enclosed is a study on the health and safety impacts of solar photovoltaics produced by the NC Clean Energy Technology Center of the NC State University. The study addresses some of the concerns raised by the public commenters at recent public hearings. The study addresses hazardous materials, electromagnetic fields (EMF), electric shock & arc flash, and fire safety. Included in the study is a discussion that leaching studies did not find a potential toxicity threat from the PV modules.

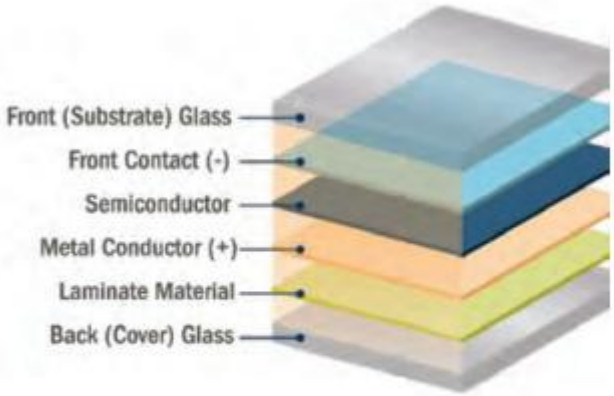
Final panel and battery module selection will be determined closer to construction; however, the panels will be UL-listed (Underwriters Laboratories, a global safety science organization), the panels and BESS will comply with all electrical codes, and neither will contain Per- and Polyfluoroalkyl Substances (PFAS).

Per the enclosed Solar Energy Industries Association (SEIA) PV Toxicity Factsheet: *while solar panels use mostly common materials with very low toxicity—glass and aluminum account for over 90 percent of a solar panel's mass—silicon-based solar panels use trace elements of lead for antireflective coating and metallization on solar cells inside the panel. For all solar panel types, the concentration of toxic chemicals is significantly below EPA values for screening health of air, soil, and water. Solar panels prevent hazardous materials from entering the environment for as long as the panels are in use, which could be 35 years or more. Researchers have tested the performance of solar encapsulants under adverse conditions, such as by crushing solar panels six times with a landfill compactor applying 50 tons of weight. The remaining pieces retained their front- and backside encapsulation and fragment sizes large enough to prevent chemical leaching.*

The Applicant further notes that the New York State Inter Agency Fire Safety Working Group Air, Soil, And Water Data Findings, which reviewed the results of data collected after four fires at battery energy storage facilities, concludes, "… there were no reported injuries, no harmful levels of toxins detected, and no long-term off-site impacts involving any migration of contaminants associated with the fires."



Silicon Panel
Source: PV Junction Box Mounting and Sealing Advances



CadTel Panel
Source: Achilles' Heel: Cell Cracking

The Applicant is amenable to a Special Condition of Approval requiring that product specification sheets and safety data for panels, battery, inverters, and transformers be provided to the Town in conjunction with the building permit application prior to construction. These materials will demonstrate that the panels are free of PFAS when they leave the factory and are made of inert materials that do not pose a risk of leaching or contamination, even in the event of potential damage. Further, the solar panels, battery energy storage unit and other electrical equipment are proposed to be sited approximately 200' from the on-site wetlands (*beyond the 100' wetland buffer zone).

Additionally, the BESS will have an automated fire suppression system. Although the exact BESS unit has yet to be finalized, it is anticipated it will be comparable to the current aerosol fire suppression systems, which generally use naturally occurring atmospheric gases and non-toxic metal salts as their components, which are environmentally benign. Similarly, the dry pipe spraying will use pressurized water, which does not result in pollutant release.

BESS Chemistry and Cells

- **Cell Type:** Lithium Iron Phosphate (LFP, $LiFePO_4$) prismatic cells.
- **Configuration:** Each liquid-cooled module contains 104 cells in series (1P104S). Multiple modules are assembled into racks, and 8 racks form a 20-foot EnerX container.

- **Material Composition:**
  - **Cathode:** Lithium Iron Phosphate ($LiFePO_4$).
  - **Anode:** Graphite-based carbon.
  - **Electrolyte:** Organic carbonate solvents with lithium hexafluorophosphate ($LiPF_6$) salt.
  - **Separator:** Microporous polyolefin (polyethylene/polypropylene).
  - **Cell Case:** Aluminum alloy casing for thermal stability and mechanical protection.

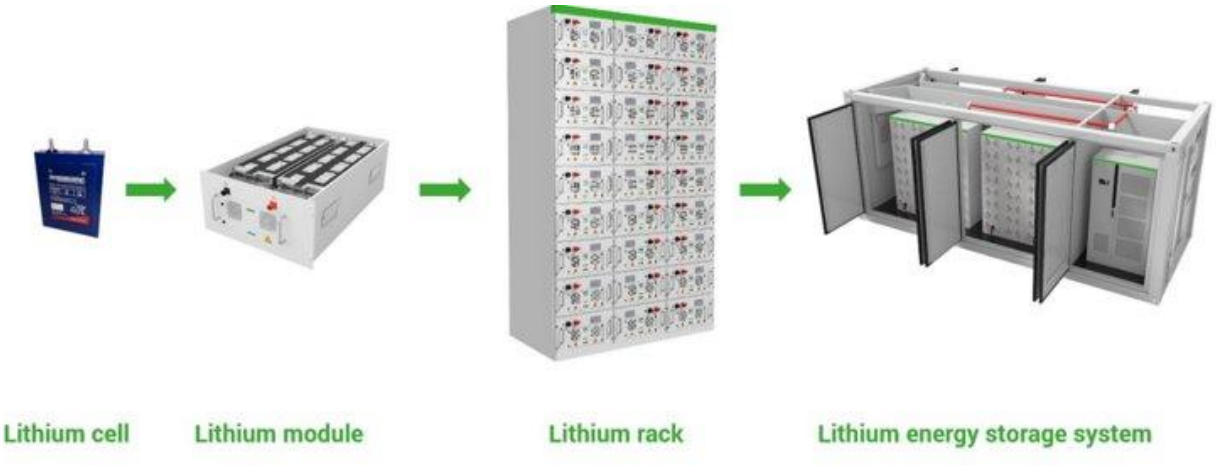
Key properties: **LFP is considered one of the safest lithium-ion chemistries, with high thermal stability and non-oxygen releasing cathode material.**

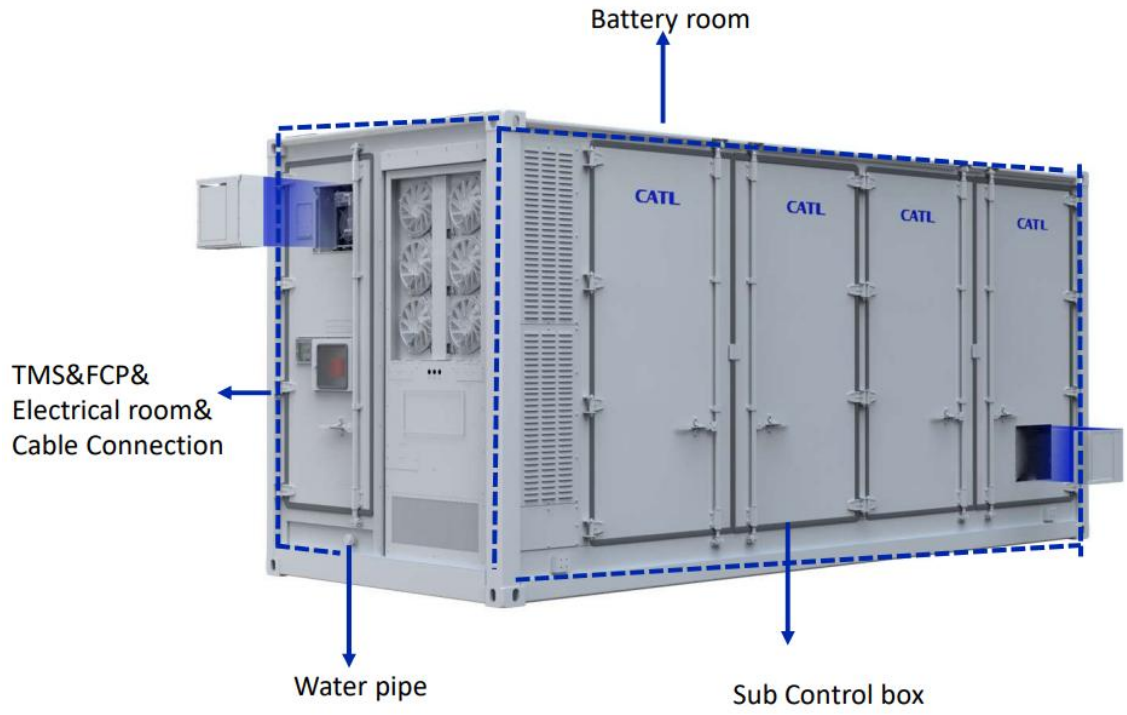
Container System (EnerX 20-ft BESS Unit)

- **System Configuration:** 8 racks per container, each with 4 battery packs.
- **Materials:**
  - **Enclosure:** Galvanized and coated structural steel container.
  - **Internal Structural Supports:** Aluminum alloy and stainless steel fasteners.
  - **Thermal Management:** Ethylene glycol/deionized water coolant mixture (50/50) circulated by liquid cooling system.

Hazardous Materials and Safety

- **Electrolyte:** Classified as flammable; sealed within prismatic cells.
- **Battery Packs:** Certified under UL 9540A, UN38.3, IEC 62619, NFPA 855, and related standards.
- **Coolant:** Non-flammable ethylene glycol/deionized water solution.
- **Enclosure:** Non-combustible metal housing with protective coatings.





The addition of the BESS is necessary for the Project to meet the eligibility requirements of the Solar Massachusetts Renewable Target (SMART) Program (225 SMR 28.00), which promotes cost effective solar development throughout the Commonwealth. The Project is consistent with and advances the Commonwealth's renewable energy initiatives, including the 2050 Net Zero Emissions target outlined in the Massachusetts Clean Energy and Climate Plan for 2050. The Commonwealth cannot meet its 2050 net-zero goal without significant areas of ground mounted solar. The vast majority (approximately 90%) of the technical potential of solar in Massachusetts is ground-mounted solar, so this source plays an exceptionally important role in helping meet the Commonwealth's clean energy mandates. See Massachusetts Technical Potential of Solar report prepared by Synapse Energy Economics, Inc. for the Massachusetts Department of Energy Resources, July 6, 2023; linked here: https://www.mass.gov/doc/technical-potentialof-solar-in-massachusetts-report/download.

Stormwater Management
The proposed stormwater management system for the Project has been designed in accordance with the MassDEP Stormwater Handbook.

Stormwater from the site will be conveyed to the proposed infiltration basins where it will be detained and infiltrated prior to discharge. Please refer to the Stormwater Management Report dated July 22, 2025, for additional information on the proposed stormwater management system.

Water Quality
The proposed stormwater management system for the Project will meet the water quality criteria for stormwater runoff in accordance with the MassDEP Stormwater Handbook.

Enclosed is a study on the health and safety impacts of solar photovoltaics produced by the NC Clean Energy Technology Center of the NC State University. The study addresses some of the concerns raised by the public commenters at recent public hearings. Included in the study is a discussion that leaching studies did not find a potential toxicity threat from the PV modules.

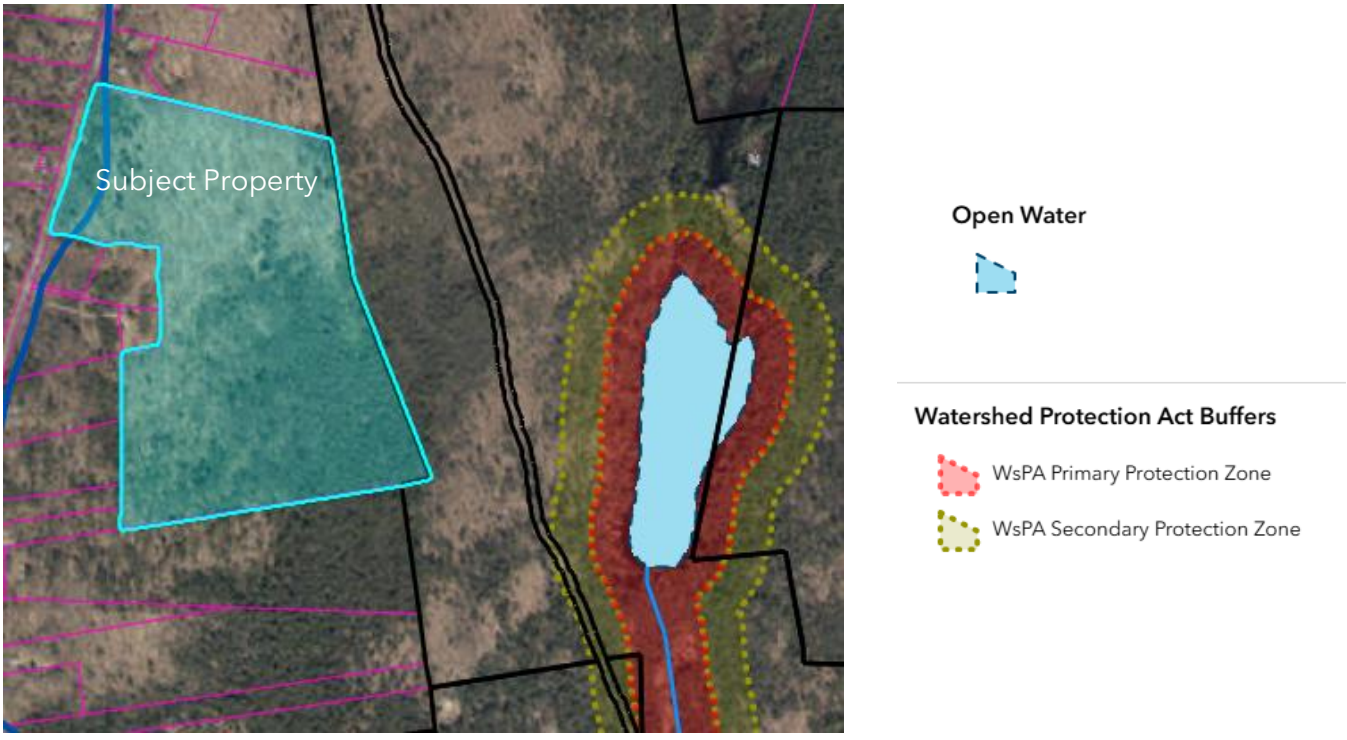
The Applicant intends to revise the design of the BESS foundation to include secondary containment. The secondary containment system will be a concrete vault sited directly beneath the BESS, which would be utilized in the unlikely event of a BESS fire, which was not allowed to burn out as current best practices recommend, and water must be applied to the BESS. The secondary containment system will be sized appropriately and with an industry-standard factor of safety. The Applicant is not installing the secondary containment vault for a leak of BESS materials as that does not occur. Liquids trapped within the secondary containment system will be pumped and handled by an appropriate hazardous waste contractor and removed and disposed of off-site in accordance with local, state, and federal requirements. The addition of the concrete secondary containment area will be reflected on the forthcoming revised site plan set.

As detailed in the Applicant's Request for Amended Order of Conditions to the Commission, the Project is not anticipated to pose an environmental or pollutant risk. Several statements have been made by members of the public about potential impacts to water sources. These statements are speculative and not grounded in any legitimate risk. Simply put, the Project does not pose a reasonable risk of impacting public and private water supply or groundwater supplies.

Outstanding Resource Waters
The purpose of 314 CMR 4.0 Massachusetts Surface Water Quality Standards, is to protect the health and enhance the quality and value of water resources by upholding the objectives of the federal Clean Water Act including the restoration and maintenance of existing water quality including, where appropriate, the prohibition of discharges of pollutants. Pursuant to 314 CMR 4.0, surface waters are defined as *All waters other than groundwaters within the jurisdiction of the Commonwealth including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters and vernal pools.* The Project does not propose work within surface waters or the discharge of pollutants including untreated stormwater runoff into surface waters and therefore these standards are not applicable.

Although the Project does not propose activities within surface waters or wetland resources areas and the majority of the work is proposed within the outer 100-feet of the buffer zone, the stormwater management system has been designed to include stormwater infiltration BMP's which will detain, treat, and infiltrate stormwater prior to discharge. Please refer to the Stormwater Management Report dated July 22, 2025 for additional information on the proposed stormwater management system.

Lastly, the property lies outside the jurisdiction of the Watershed Protection Act and is not considered an affected parcel as of July 2025. Please refer to the image below obtained from the Watershed Protection Act Viewer online, accessed September 11, 2025.



Water Usage
The Project will not require water during construction. Temporary watering may be necessary to ensure appropriate final vegetative stabilization of lawn areas within the array area. In this case, water will be provided by the landscape contractor from off-site sources.

Fire Safety
The Applicant has been coordinating with the Wendell Fire Department to discuss and prepare emergency response plans, appropriate access, training, etc. Additionally, the Applicant understands that the fire code requires commonality for connections to the fire apparatus. The dry pipe sprinkler system installed within the BESS enclosure is designed in accordance with NFPA 13 and NFPA 15. For battery energy storage systems of this scale and enclosure type, the typical design density is 0.3 gpm/sq ft over a minimum area of 2,500 sq ft (per NFPA 855 Section 9.4.2.4 and referencing UL 9540A testing data). That results in a total design flow rate of approximately 750 gpm, though the actual flow may vary slightly based on the specific compartment size and head layout.

The Applicant anticipates that the BESS will be a fully enclosed system, constructed on concrete piers above a concrete secondary containment area (vault). The addition of the concrete secondary containment area will be reflected on the forthcoming revised site plan set.

The BESS system will have an automated fire suppression system that will conform with applicable requirements of the Massachusetts Fire Code in effect at the time of issuance of the Building Permit. Additional specification sheets on the suppression system can be provided at the time of the Building Permit if the Commission requests it as a Special Condition of Approval.

In the event of a power outage, the BESS contains an auxiliary system which provides self-powering capabilities for 24 hours. There is an additional 24-volt DC backup battery with a capacity of approximately 6 – 8 hours. Additionally, the system contains a loss of power alarm which would alert the Applicant to the outage and prompt an immediate dispatch of appropriate personnel to diagnose and resolve the issue.

The Applicant further notes that the New York State Inter Agency Fire Safety Working Group Air, Soil, And Water Data Findings, which reviewed the results of data collected after four fires at battery energy storage facilities, concludes, "… there were no reported injuries, no harmful levels of toxins detected, and no long-term off-site impacts involving any migration of contaminants associated with the fires."

Geotechnical Analysis and Test Pits
Test pits are scheduled to occur in mid-October 2025. An analysis of the results will be provided to the Commission once available. At this time, blasting is not anticipated to be required to construct the Project.

Applicant's Responses to Town Engineer Comments

The Town Engineer, James Slavas, provided the following comments on the Project via email on August 1, 2025. For the Administrative Record, Town Engineer comments are provided in *italics*, followed by the Applicant's response in **bold** detailed how the comment has been addressed.

The amended application contains the complete specs for the BESS, which is a CAT-L Ener-X unit.

Applicant's Response: No response required.

This is a lithium iron-phosphate [LiFePO4] battery.

Applicant's Response: No response required.

The battery modules, Battery Management System ["BMS"], controls, sensors [heat, fire, hydrogen, CO], cooling, ventilation and fire suppression systems are pre-assembled and housed in a custom 20' HQ container.

Applicant's Response: No response required.

The battery cooling system uses a refrigeration system circulating a glycol solution.

Applicant's Response: No response required.

There is an option to install a dry pipe system but since this is primarily to protect against fire spread to adjacent battery modules it is probably not necessary for this single-unit configuration. I do note, however, that the plan drawings include a "Battery Energy Storage Auxiliary Pad". It is unclear to me whether this is meant for auxiliary BESS control/interconnect equipment or for a possible additional battery unit. In the latter case it may make sense to request the dry pipe system be installed. However, unless the dry pipe connection is extended beyond the 100' radius safety perimeter I do not see how the WFD responders could safely attach the pumper to the dry pipe system during a thermal run-away event.

Applicant's Response: The BESS Auxiliary Pad will not include BESS components; it will include other electrical equipment associated with the function and regulation of the BESS.

The built-in fire suppression system uses a water aerosol to suppress a fire in the BESS' electronics cabinet but is not intended to deal with a thermal run-away event.

Applicant's Response: No response required.
In case of a thermal run-away event, the emergency response plan calls for no offensive suppression operations; the fire will be left to burn itself out.

Applicant's Response: No response required. Further coordination and consultation with the Fire Department is occurring concurrently with the permitting process.

The main dangers relate to an explosive deflagration and the release of toxic gases [of particular importance hydrogen fluoride, "HF", and dimethyl carbonate]. The automated fan ventilation system will remove detected gases to prevent an explosive event but is ineffective in a thermal run-away event.

Applicant's Response: No response required.

The plan calls for a 100' radius safety perimeter around the BESS. The fire fighters could spray water on adjacent exposures for cooling but would not spray the BESS directly since this would not stop a thermal run-away event and could delay combustion of the remaining battery modules.

Applicant's Response: No response required. Further coordination and consultation with the Fire Department is occurring concurrently with the permitting process.

A fog pattern from the handline hoses/monitors would be used to control smoke and released gases and prevent their movement to unwanted areas. Water fogging and deluge systems are proven to be very effective in removing the very toxic hydrogen fluoride and such permanent systems are routinely installed around critical HF equipment at oil refineries. It is interesting to contemplate installing such a fogging system around the BESS connected to a dry hydrant outside of the safety perimeter.

Applicant's Response: No response required. Further coordination and consultation with the Fire Department is occurring concurrently with the permitting process.

With respect to the 100' safety perimeter, I note that it encompasses about three-quarters of the turn-around area which would expose responder vehicles to significant deflagration/toxic gases dangers. The plans shown on pages 309, 310 and 340 of the amended Application show 100' safety perimeter superimposed on the relatively large temporary construction delivery circle rather than the much more restrictive actual post-construction vehicle turn-around configuration.

Honoring the 100' safety perimeter would prevent safe renewal of the emergency water supply and present formidable obstacles to responder vehicular access; the initial responders would have to back down the entire access road to allow access for the firefighting equipment, which would then either have to back down to the turn-around or back up to allow access for the water replenishment vehicle[s]. I would suggest that either the turn-around be expanded westward to be out of the 100' safety perimeter or that the BESS be relocated eastward so that the safety perimeter lies outside of the turn-around.

Applicant's Response: The Applicant intends to revise the plans to shift the BESS approximately 40' east so that the 100' safety perimeter around the BESS does not interfere with the proposed access road and turnaround area. The Applicant will reflect this change on the forthcoming revised site plan set.

We appreciate the Commission's time and attention in reviewing the Project, and hope that this additional information is helpful in facilitating your review. Should you have any questions please contact us at (508) 366-0560.

Sincerely,

BEALS AND THOMAS, INC.

Eric J. Lasi, PE, LEED AP
Vice President

Enclosures: Acoustical Exhibit, dated October 2, 2025 (1 sheet)
Solar Energy Industries Association PV Safety Factsheet (3 pages)
Health and Safety Impacts of Solar Photovoltaics by NC Clean Energy Technology Center, NC State University (18 pages)

cc: Wendell Planning Board (1 copy via Email)
Wendell Board of Health (1 copy via Email)
Wendell Solar, LLC (1 copy via Email)

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