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May 13, 2025

Via Electronic Mail and Hand Delivery

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

Re: **Petition No. 1653 – East Point Energy, LLC Petition for a Declaratory Ruling that a Certificate of Environmental Compatibility and Public Need is not Required for the Construction, Operation and Maintenance for a 20 MW AC Battery Storage Facility and Associated Equipment at 1825 South Main Street in Middletown, Connecticut, and Associated Electrical Interconnections**

Dear Attorney Bachman:

On behalf of East Point Energy, LLC ("EPE"), enclosed please find the original and fifteen (15) copies of the Petitioner's Responses to the Council's Interrogatories for Petition No. 1653. Electronic copies of these responses have also been sent to the Council today.

If you have any questions or need any additional information, please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Enclosure

32148953-v1

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

EAST POINT ENERGY, LLC PETITION FOR A DECLARATORY RULING, PURSUANT TO CONNECTICUT GENERAL STATUTES §4-176 AND §16-50K, FOR THE PROPOSED CONSTRUCTION, MAINTENANCE AND OPERATION OF A 20-MEGAWATT AC BATTERY ENERGY STORAGE FACILITY AND ASSOCIATED EQUIPMENT TO BE LOCATED AT 1825 SOUTH MAIN STREET, MIDDLETOWN, CONNECTICUT, AND ASSOCIATED ELECTRICAL INTERCONNECTIONS.	:	PETITION NO. 1653 MAY 13, 2025

RESPONSES OF EAST POINT ENERGY, LLC
TO CONNECTICUT SITING COUNCIL INTERROGATORIES

On April 22, 2025, the Connecticut Siting Council ("Council") issued Interrogatories to East Point Energy, LLC ("Petitioner"), relating to Petition No. 1653. Below are the Petitioner's responses.

Notice

Question No. 1

Has East Point Energy, LLC (EPE) received any comments since the Petition was submitted to the Council? If yes, summarize the comments and how these were addressed.

Response

EPE received comments from the City of Middletown Fire Department, City of Middletown Water and Sewer Department, Department of Environmental Quality, and Department of Public Health. Following receipt of those comments EPE held an in person round table meeting on March 19, 2025 with the City of Middletown Mayor, General Counsel, Director of Economic and Community Development, Fire Marshal, Deputy Fire Marshal, Director of

Planning, Director of Engineer, Director of Water and Sewer, and City Engineer to discuss their comments.

A summary of EPE's responses is as follows:

1. The project site would be graded and constructed to direct all stormwater and potential firefighting water runoff away from the Laurel Brook Reservoir, ensuring flow is directed eastward.

2. Site design will comply with the 2024 Connecticut Stormwater Quality Manual and the 2024 Connecticut Guidelines for Soil Erosion and Sediment Control.

3. All necessary permits from the Connecticut Department of Energy and Environmental Protection (DEEP) will be obtained prior to the commencement of construction.

4. A plume analysis is currently underway to evaluate potential impacts fire-related incident might have on water in the water tank located approximately 328 feet north of the site.

5. In the event of a fire-related incident, EPE will reimburse the City for the cost of retaining a third-party environmental consultant to conduct air and water quality testing and monitoring both after the incident.

6. While some other Battery Energy Storage System facility ("BESS") fires have occurred, available reports do not indicate contamination levels exceeding health and environmental standards. The Emergency Response Plan (ERP) will explicitly prohibit the use of firefighting suppressants containing per- and polyfluoroalkyl substances (PFAS).

7. A draft site-specific Spill Prevention, Control, and Countermeasure (SPCC) Plan will be developed prior to construction, detailing response and containment procedures.

8. The final ERP will also include formal notification protocols for local water, sewer, and emergency services.

9. All plans, including the ERP and SPCC, will be reviewed by the city engineer, and water and sewer departments, prior to the start of construction.

10. Due to on-site safety protocols, access by non-emergency personnel will require an escort by a designated EPE employee.

Question No. 2

Referencing Petition p. 9 and Exhibit C, how many abutters and residents were in attendance at the December 18, 2024 community meeting, and what comments or concerns were raised? How were these concerns addressed?

Response

No community members, abutters, or government officials attended the December community meeting. Notice of this community meeting was published in the Middletown Press and was sent to abutting landowners and Government Officials.

Question No. 3

Referencing Petition Exhibit C, EPE held a May 31, 2024 meeting with the Middletown Fire Department. What comments were received, and what concerns were raised? How were these concerns addressed?

Response

The City of Middletown Fire Department participated in the "BESS 101" fire training provided by sponsored by EPE and conducted by Energy Safety Response Group (ESRG). The session covered key lessons learned from past battery energy storage system (BESS) incidents, including the recent events. It also highlighted how advances in technology have improved safety and fire prevention measures in modern BESS facilities.

The training addressed fundamental firefighting principles specific to BESS incidents, equipping responders with a better understanding of the unique challenges these systems present. In addition, EPE discussed the Fire Department's critical role in developing the site-specific emergency response plan and emphasized the importance of ongoing collaboration in future fire training exercises prior to the construction and commissioning of the facility.

Public Benefit

Question No. 4

Please respond to the following related to public benefit:

a) Would the proposed facility be necessary for the reliability of the electric power supply of the state? Explain why or why not.

b) Would the proposed facility be necessary for the development of a competitive market for electricity? Explain why or why not.

c) Would the proposed facility contribute to the forecasted generating capacity requirements? Explain why or why not.

d) Would the proposed facility reduce dependence on imported energy resources? Explain why or why not.

e) Would the proposed facility diversify the state's energy supply mix? Explain why or why not.

f) Would the proposed facility enhance reliability? Explain why or why not.

g) Would the proposed facility provide winter reliability benefits for the grid in the event that natural gas supplies are curtailed and/or backup oil supplies are limited for natural gas-fired power plants in the region?

Response

a. Connecticut and other New England states are heavily dependent on natural gas for heating, cooking, and electricity generation, leading to reliability issues during extreme winter events and causing regional electricity prices to spike whenever natural gas prices rise. The proposed EPE Project will bolster electric reliability by peak shaving, optimizing the use of excess renewable energy, supplying electricity during high demand periods, thus reducing dependence on natural gas-fired peaker plants which will in turn help stabilize the grid during times of high electricity usage.

The proposed BESS will optimize the use of excess renewable energy, making it more available during peak demand periods. As Connecticut and other New England states increase their reliance on intermittent renewable energy, these battery systems will be crucial for maintaining electric reliability.

The proposed BESS Project, offer rapid response times, high safety, proven reliability, and versatile applications. They can respond with full capacity in less than 250 milliseconds when needed, providing the electric grid essential services like frequency regulation and voltage support.

Ultimately, the project will benefit ratepayers and the community by facilitating increased renewable penetration without compromising reliability. This will help reduce the reliance on fossil fuels and support a more sustainable energy future.

b. Yes, and consistent with the State of Connecticut's comprehensive energy policy. Specifically in 2021, the General Assembly enacted legislation requiring the State's Public Utilities Regulatory Authority (PURA) to establish a goal for front of the meter distributed generation ("DG") projects, such as the proposed EPE Project, and directed PURA to meet the established goals pursuant to Section 3 of Public Act 21-53, An Act Concerning Energy Storage. EPE is developing the proposed Long Hill Energy Center Project in specific response to and in support of Connecticut's stated energy goals.

Furthermore, the ability for generation to be built, including BESS, is necessary for the existence of a competitive market. Through the purchase and storage of excess energy during low-demand periods and subsequent discharge of that energy back into the grid during high-demand periods, BESSs ensure supply and demand are balanced efficiently and cost effectively within the wholesale market. The proposed facility would help create a more efficient, cost-competitive, and resilient electricity market.

c. Yes, subject to the terms of a future revenue agreement or participation in an incentive program with CT PURA, the EPE Project plans to participate in the wholesale capacity market with the objective of securing capacity supply obligations (CSOs). Upon securing CSOs, ISO-NE will count on EPE's Project to participate as a capacity resource. If the Project does not secure a CSO, the qualified capacity available to the market with obligations would be reduced.

d. Yes. The proposed BESS would reduce dependence on imported energy resources by facilitating the storage and use of locally generated renewable energy, reducing the need for backup imports during peak demand or low generation periods. Additionally, it supports energy security and helps integrate renewable energy into the grid, lowering reliance on fossil fuels and imported electricity.

e. Yes. The Project will be able to support future build out of intermittent renewable energy in this rural area of the grid which will diversify the state's energy supply mix. The EPE Project will be able to indirectly benefit the system due to the availability of the BESS to draw from all energy resources that may be generating at a time of low demand and make the energy available during periods of high demand.

f. Yes. The proposed BESS would enhance reliability by providing fast, responsive power during imbalances, managing peak demand, supporting renewable energy integration, acting as a backup during disruptions, and providing important grid services like frequency regulation. Its ability to quickly respond to changes and store excess energy for later use makes it an essential tool for maintaining a stable and reliable energy grid.

g. Yes. Connecticut and the other New England States currently have an overreliance on natural gas as a fuel for home and business heating as well as cooking and electricity generation. As a result, during extreme winter events, the region has and may continue to suffer reliability issues. The proposed BESS by storing excess energy during times of low demand or high renewable output, can provide fast-response power during peak demand periods, ensuring a stable and reliable electricity supply when traditional generation sources face constraints. This increases resilience, reduces dependence on fossil fuels, and supports a more sustainable and reliable energy system.

Question No. 5

Would EPE participate in an ISO-NE Forward Capacity Auction for the Project? If yes, which auction(s) and capacity commitment period(s)? If no, does EPE currently have a Capacity Supply Obligation with ISO-NE for the Project?

Response

The EPE Long Hill Energy Center Project is a proposed stand-alone, front-of-the-meter (FTM) BESS. The Project intends to participate in the ISO-NE Forward Capacity Auction subject to the terms of a future revenue agreement. The earliest capacity commitment period that the EPE Long Hill Energy Center Project could deliver a Capacity Supply Obligation would be June 2027 to May 2028, which corresponds with FCA 19.

Project Development

Question No. 6

What is the estimated cost of the project? How are costs recovered? Is the energy being purchased at market rates?

Response

The costs to construct the BESS project are expected to follow the going market rate for utility-scale storage at the time of construction. A reference that may be useful for estimating project costs is the National Renewable Energy Laboratory (NREL) report: Cost Projections for Utility-Scale Battery Storage: 2023 Update. Per the NREL report, based on a 2027 projected cost of construction is $284 - $459/kWh. Costs will be recovered through wholesale market participation and/or future long-term revenue agreements.

Question No. 7

Referencing page 5 of the Petition, was the project selected for the state Energy Storage Solutions Program? If yes, when was the project selected and what program incentives apply to the project?

Response

No. The project is a proposed front of the meter, stand-alone energy storage system that will participate in wholesale energy, capacity, and frequency regulation markets. The Energy Storage Solutions ("ESS") program aims to incentivize residential, commercial, and industrial customers to consider adding storage at their homes or businesses with application to retail customers. An ESS program for Front-of-the-meter distribution facilities is currently underway and a framework is expected to be released in late September 2025.

Question No. 8

What is the term of the agreement for EPE to provide energy storage, and with which entity? If the facility operates beyond the terms of such agreement, will EPE decommission the facility or seek other revenue mechanisms?

Response

The EPE Long Hill Energy Center Project is not currently subject to a revenue agreement. However, EPE intends to pursue a revenue agreement through future state procurement opportunities. EPE may pursue other revenue options at the end of an agreement's term and may possibly extend the life of the BESS at that time. If such revenue options are either not available at the end of the agreement period or do not financially support continued operations of the Project, EPE would decommission the system at that time.

Question No. 9

If EPE transfers the facility to another entity, would EPE provide the Council with a written agreement as to the entity responsible for any outstanding conditions of the Declaratory Ruling and quarterly assessment charges under CGS §16-50v(b)(2) that may be associated with this facility, including contact information for the individual acting on behalf of the transferee?

Response

If EPE transfers the facility to another entity, EPE will provide notice of the entity responsible for management and operations of the Project and any outstanding conditions of the declaratory ruling and said entity's contact information.

Proposed Site

Question No. 10

Explain why the proposed site was selected for this Project.

Response

The proposed site is ideally located across the road from an existing Eversource distribution substation, enabling a cost-effective and reliable interconnection. The area is already home to existing industrial infrastructure, including a telecommunications facility and other utility infrastructure, making it well-suited for additional energy facilities. The site lies within a recognized load pocket, providing critical support during transmission contingencies and enhancing local grid stability. Additionally, there are seven solar power plants within a 10-mile radius of the proposed site, allowing the BESS to help integrate and optimize intermittent renewable generation. The nearest residential home located approximately 400 feet away.

Question No. 11

What are the benefits of the proposed site location? For example, is the proposed site located within a "load pocket" area or on the "grid edge"?

Response

The proposed site is strategically located for direct interconnection to the Dooley Substation, which serves a significant load of approximately 50 MW. This enhances local grid reliability, especially during transmission outages, by maintaining service at the distribution level. The site is also within 10 miles of seven solar power plants, supporting better utilization of intermittent renewable energy and contributing to overall grid flexibility.

Question No. 12

Please provide the following:

a) Distance from the BESS perimeter wall to nearest property line;
b) Distance from the BESS perimeter wall to the nearest residential property line;
c) Distance from the BESS perimeter wall to the Dooley Substation;
d) Distance from the nearest BESS perimeter wall to the Eversource ROW and nearest transmission structure;
e) Distance from the BESS perimeter wall to the telecommunications tower located south of the proposed BESS;
f) Distance from the nearest part/corner of the battery containers to the nearest property line;
g) Distance from the nearest part/corner of the battery containers to the nearest residential property line; and
h) Distance from the nearest part/corner of the battery containers to the nearest residential structure.

Response

a. The BESS perimeter wall is approximately 47.2 feet from the nearest property line.

b. The BESS perimeter wall is approximately 252.8 feet to the nearest residential property line.

c. The BESS perimeter wall is approximately 171.2 feet from the existing fence encompassing the Dooley Substation.

d. The BESS perimeter wall is approximately 169 feet from the Eversource R.O.W. and approximately 258.5 feet from the nearest structure.

e. The BESS perimeter wall is approximately 144.8 feet from the telecommunications tower.

f. The nearest part/corner of the battery containers is approximately 103.5 feet from the nearest property line.

g. The nearest part/corner of the battery containers is approximately 307.4 feet from the nearest residential property line.

h. The nearest part/corner of the battery containers is approximately 361.3 feet from the nearest residential structure.

Question No. 13

Referencing Petition Appendix A Sheet SP-1 Site Plan, provide the lengths of the proposed 15-foot wide utility access easement and the 20-foot wide main access drive.

Response

The proposed 15-foot wide utility easement is approximately 247 feet long. The proposed 20-foot main access drive is approximately 757 feet long.

Question No. 14

Provide the area of the fenced BESS compound.

Response

The fenced BESS compound area is approximately 37,964 square feet.

Question No. 15

Referencing Petition Appendix A, Environmental Assessment Section 3.2, p. 10, the nearest wetland is 244 feet from the site. Petition Appendix F- Phase 1 Site Assessment p. 9 states the nearest wetland is 320 feet east of the Site. Clarify.

Response

The nearest wetland is 244 feet from the site, the distance referenced in the Site Assessment Report represented the separating distance from an earlier site layout design iteration.

Proposed Facility and Associated Equipment

Question No. 16

Referencing Petition Exhibit D, provide the number of battery racks per battery storage unit, the number of battery modules per battery rack and the number of battery cells per battery module.

Response

Six Battery Racks per Battery Enclosure; eight battery packs per rack, 104 battery cells per battery pack. The Petitioner reserves the right to utilize different equipment and technology in the future before project construction commences. The Council would be notified of any such change.

Question No. 17

Referencing Petition Appendix D, why was the Powin Pod selected for this Project? What battery chemistry is used in the Powin Pod BESS units? (e.g. lithium-iron phosphate)

Response

The primary reasons why Powin Pod BESS enclosure was selected because of its high energy dense design, it is cost competitive, Powin plans to open a US manufacturing location, the Powin Pod is compatible with many commercially available inverters, and based on Powin's focus on fire safety in their design. The proposed Battery Cell chemistry is lithium-iron phosphate (LFP)

Question No. 18

Provide a summary of the available battery technology types and explain why each technology type could or could not be implemented at the proposed site. For reference, please see the response to Interrogatory No. 5 to the Council's Petition 1637 Set 2 Interrogatories at the following link: KCE CT 11 _ LLC Final Responses to Second Set Interrogatories for Petition No. 1637(20032265.1)

Response

Sodium Ion:

Sodium-ion (Na-ion) batteries are emerging as a potential alternative to lithium-ion (Li-ion) batteries for utility-scale energy storage systems. Sodium-ion batteries operate on similar principles to lithium-ion batteries but use sodium ions instead of lithium ions as charge carriers. However, this technology is still in the early development and research stages and is not commercially viable in the utility scale market at this time. Therefore, reliable products are not currently available in the utility scale market and is not available for consideration for the Project.

Positives of Sodium-ion Batteries:

1. Abundant Raw Materials: Sodium is abundant and widely available making sodium-ion batteries potentially sustainable and less prone to supply chain issues. This could lead to lower costs in the much long term for large-scale storage solutions. However, this has not yet been demonstrated at market scale.

2. Lower Cost: Sodium is a lower cost material, and this could translate into lower manufacturing costs for sodium-ion batteries in the future. Industry projections anticipate commercial availability of systems may be towards the end of this decade.

3. Good Performance at Very Low Temperatures: Sodium-ion batteries generally perform well at lower temperatures, which could be beneficial in colder climates or in regions where temperature variation is significant.

4. Environmental Considerations: Sodium-ion batteries are potentially

environmentally friendly because sodium is abundant and may be easily recycled.

Challenges of Sodium-Ion Batteries:

1. Lower Energy Density: Sodium-ion batteries typically have lower energy density than lithium-ion batteries, meaning they store less energy per unit of weight or volume. This limits their application in battery energy storage systems where high energy density is crucial for maximizing space and minimizing the weight of the storage system. Even if the technology were more advanced and available, locating a sodium ion battery would require additional space and land disturbance.

2. Cycle Life and Efficiency: Sodium-ion batteries have historically faced issues with cycle life (the number of charge/discharge cycles a battery can undergo before its performance degrades) and efficiency. Researchers are working on improving the performance of sodium-ion cells to make them more suitable for large-scale utility applications, but they are still challenged today.

3. Manufacturing and Commercialization: Sodium-ion batteries are still in the early developmental stage compared to lithium-ion batteries, which have been mass-produced and deployed extensively for various applications, including utility-scale battery energy storage systems. The scaling up of sodium-ion production and supply chains will take time and investment. There are no sodium ion batteries currently available and that would be considered financeable for project of this scale.

4. Voltage and Power Output: Sodium-ion batteries typically have lower operating voltages than lithium-ion batteries, which can affect their power output in certain applications.

Iron air:

Iron-air (Fe-air) batteries are a promising emerging technology for large-scale battery energy storage, and there is increasing interest in their viability for utility-scale battery energy storage systems. However, they are still in the early stages of development and face several technical and cost challenges before they can become widely deployed for grid applications. Therefore, this technology is not available for consideration for the Project.

Positives of Iron-Air Batteries:

1. Abundant and Low-Cost Materials: Iron is one of the most abundant elements on Earth, and the use of air (oxygen) at the cathode significantly reduces the need for expensive materials. This could make iron-air batteries much more affordable compared to other types of batteries, especially for long-duration storage.
2. Sustainability: Iron is abundant, and easily recyclable. These batteries could offer a sustainable option for large-scale storage applications that need to minimize the carbon footprint of the energy storage system.
3. Safety: Iron Air batteries do not pose a combustibility risk.
4. Long Duration Energy Storage: Iron-air batteries have the potential for high energy density in terms of storage capacity, especially in terms of energy density per unit of weight. Iron-air batteries could also provide longer-duration storage (up to 100 hours or more) compared to lithium-ion batteries, which typically excel in shorter-duration, high- power applications.

Challenges of Iron-Air Batteries:

Despite the promising advantages, there are several significant challenges to overcome before iron- air batteries can be considered commercially viable for utility-scale battery energy storage systems:

1. Energy Efficiency: The energy efficiency of iron-air batteries is currently lower than that of lithium-ion batteries, particularly in terms of charge/discharge cycles. This is primarily due to issues with the electrolyte, reaction kinetics, and overall efficiency of the oxygen reduction/oxidation process.

2. Cycle Life and Durability: The cycle life of iron-air batteries is still a major hurdle. The repeated oxidation and reduction of iron can cause the formation of by-products that degrade the battery's performance over time. Improving the durability and cycle life of iron-air batteries is critical for their adoption in grid-scale applications where longevity is essential.

3. Slower Charge/Discharge Rates: Iron-air batteries have relatively low power density compared to lithium-ion or sodium-ion batteries, which means they may not be suitable for applications requiring fast response times, such as peak shaving or frequency regulation. They are better suited for long-duration energy storage, where the need is for large-scale, sustained energy output over extended periods (e.g., 12-100 hours).

4. Development Stage: While iron-air batteries have been the subject of increasing research, they are still in the experimental phase compared to more mature technologies like lithium- ion. Commercial deployment is not expected until early next decade, as significant technological advancements are needed in areas like electrode design, electrolyte stability, and overall system integration.

5. Space requirements: Current space requirement for iron-air battery energy storage systems is ~2.5MW per acre, so a 20 MW battery energy storage system would require 7 acres. This is for the battery facility only, and does not include other requirements such as

setbacks, perimeter clearing, laydown, road, interconnection equipment and stormwater management. The construction of an Iron-Air battery energy storage systems would result in more than double the proposed land disturbances.

Flow batteries:

Flow batteries are increasingly being considered for battery energy storage systems due to their unique advantages, particularly for long-duration storage and grid stabilization. While they are not yet as widely deployed as lithium-ion batteries, flow batteries have several characteristics that make them a promising future solution for large-scale, stationary energy storage. A Flow battery energy storage system would not be applicable at the Project location as the cost of energy would be unaffordable under the PURA front of meter Distributed Generation Battery Energy Storage System Program, the systems have low power applications and low energy density meaning the system would lead to significantly more land disturbance.

Positives of Flow Batteries:

1. Long Duration Energy Storage: Flow batteries excel at long-duration storage, which is crucial for balancing grid fluctuations caused by intermittent renewable sources such as solar and wind. Flow batteries can provide energy storage for hours to days. This makes them suitable for seasonal storage, grid peaking, and back-up power.

2. Safety and Environmental Impact: Flow batteries are inherently safe as they don’t use flammable electrolytes, reducing the risk of fires and thermal runaway. Their chemistries are generally considered to be low toxicity.

3. Independent Power and Energy Scaling: As the energy storage and power components are separated, flow batteries can be designed to deliver higher capacity or

more power independently. This flexibility is advantageous for utility-scale applications, where both the power and duration of storage need to be optimized for specific needs, such as grid balancing or renewable integration.

Challenges of Flow Batteries:

1. Lower Energy Density: One of the main limitations of flow batteries is their lower energy density compared to lithium-ion batteries. This means that flow batteries require larger physical systems to store the same amount of energy, leading to higher space and infrastructure requirements. For some applications, particularly where land area is limited, this can be a disadvantage. If the technology were cost competitive, locating a flow battery would require additional space and land disturbance and it is unlikely that a 20 MW system with setbacks and stormwater management systems would fit as proposed.

2. Cost: While flow batteries may offer long-term cost savings due to their longevity and minimal degradation, their initial capital cost is higher than lithium-ion systems. The cost of the electrolyte materials, tanks, and balance-of-system components (pumps, pipes, etc.) adds to the overall price.

3. Efficiency Losses: Flow batteries typically have much lower round-trip efficiency (the ratio of energy delivered by the battery versus the energy used to charge it) than lithium- ion batteries. Vanadium flow batteries, for example, typically have efficiencies around 70%, compared to 90%+ for lithium-ion batteries. This may make them less attractive for applications where efficiency is critical.

4. Complexity and Maintenance: Flow batteries are more complex than lithium-ion systems, requiring additional components like pumps, valves, and cooling systems. The

need for continuous electrolyte circulation adds a level of operational complexity, which could lead to higher maintenance costs and increased system downtime if issues arise.

Lithium-Ion Batteries:

The preferred solution for this 20 MW, 4 hour front-of-the-meter BESS was determined to be Lithium-Ion batteries for the following reasons. Lithium-Ion batteries are the most energy dense technology on the market while being economically viable. They have a high Round Trip Efficiency (~90%). Additionally, Lithium-Ion batteries used in BESS have ridged safety standards (NFPA 855 and UL 9540 / UL 9540A). Lithium-ion can refer to a wide array of chemistries, however, it ultimately consists of a battery based on charge and discharge reactions from a lithiated metal oxide cathode and a graphite anode. Examples of Lithium-ion batteries are Nickel Manganese Cobalt (NMC), Lithium Iron Phosphate (LFP), and Lithium Nickel Cobalt Aluminum Oxide (NCA), etc.

- NMC: On average NMC batteries when in thermal runaway vent gases into the enclosure that have a lower flammability limit than LFP battery cells, this means the gas released from an NMC battery is more likely to catch fire at lower concentrations than that from an LFP battery. NMC Batteries have a narrower voltage range than LFP, therefore NMC batteries are more likely to experience Lithium plating of the Anode (negative electrode). Lithium plating leads to cell degradation and high risk of failure.
- LFP: according to Energy Power Research Institute LFP Batteries have a longer time under duress before thermal runaway is initiated; lower maximum temperature during thermal runaway than NMC and NCA. Additionally, LFP batteries have are thermally stable when operating in a wide temperature range. The Petition is proposing the use of LFP batteries because they are regarded as the safest Lithium-ion battery on

the market.

Question No. 19

Identify the general equipment within the Powin Pod battery container, e.g. batteries, HVAC system.

Response

Equipment within the battery container includes but is not limited to battery cells, battery pack, battery pack controller, sting controllers, racks, Battery Management System, operating system, electrical cabinet, electrical cabinet HVAC, chiller, dehumidifier, Fire Alarm Control Panel, gas sensors, smoke sensors, temperature sensors, deflagration panels, exhaust fan, and inlet fan, etc.

Question No. 20

Referencing Petition Exhibit A – Sheet OP-1, provide the size of the transformers (kVA or MVA) that would be installed on each equipment pad. How many Sungrow SC5000 inverters would be installed on each equipment pad?

Response

Each Sungrow SC5000UD-MV-US inverters is rated at 5000 kVA.Each Sungrow MVS5000-LV-US transformer is rated at 5140 kVA.One Sungrow SC5000 and MVS5000 will be located on each Inverter / Transformer equipment pad. Please see Attachment A Inverter and Transformer Datasheets.

Question No. 21

Referencing Site Plan OP-1, provide the dimensions (LxWxH) of the O&M building. What BESS equipment would be within the building?

Response

O&M building dimensions: 20’L x 8’W x9.5’H

The O&M building will hold spare parts and tools. These are generally items that are used frequently during maintenance and operations or long lead time parts. No battery cells or battery packs will be stored in the O&M building.

Question No. 22

Referencing Appendix D provide a manufacturer inverter specification sheet that provides details on the inverter silencer kit.

Response

Specification sheets for the inverter silencer kit are currently unavailable but will be provided prior to the commencement of construction.

Question No. 23

Referencing Appendix D, what material is the sound wall made of? What is the lifespan of the material?

Response

The sound barrier material has not been determined at this time. It will likely be a metal or concrete barrier with a lifespan of a minimum of 25 years.

Question No. 24

Referencing Petition Site Decommissioning Plan, it states the type of foundation is to be determined. What foundation types are being considered? When will EPE determine the foundation type?

Response

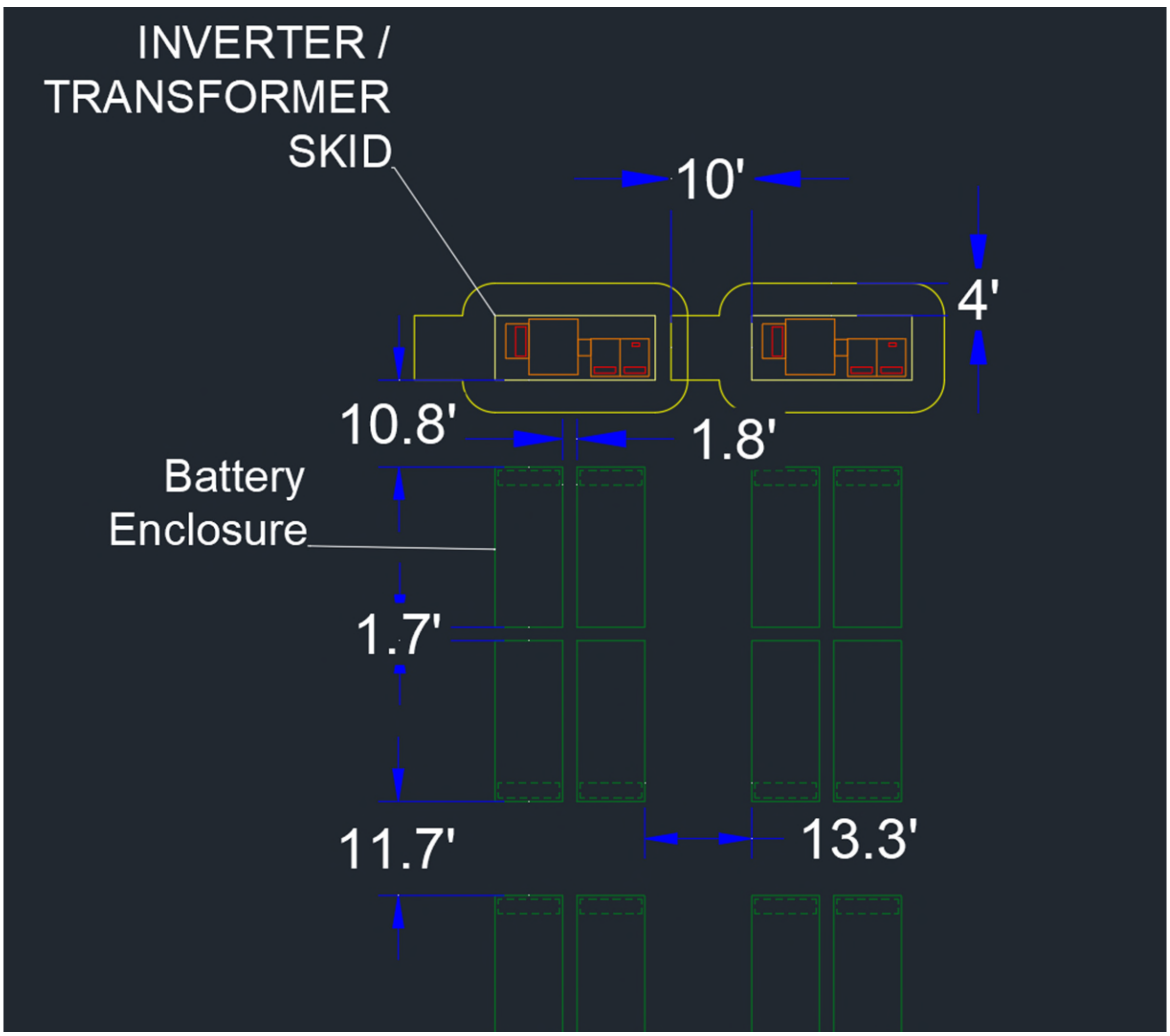
The primary foundations that are being considered are concrete pad foundations, piers, and piles. The final foundation design will not be determined until the Building Permit phase.

Question No. 25

What is the distance between each battery container and adjacent containers and equipment? What is the minimum distance required by applicable safety/construction codes?

Response

The minimum spacing requirements according to Powin and Sungrow are shown below. We are unaware of any codes related to the distance between BESS enclosures in CT. NFPA 855 and UL 9540 are designed tools to ensure that in the event of a fire propagation does not occur between enclosures.



Question No. 26

Would lighting be installed at the proposed facility? If so, identify the type(s) of lighting for the proposed facility. When would lighting operate?

Response

A lighting plan will be developed closer to BESS construction. Typically, BESS lighting would be needed for security and/or maintenance activities and would be designed to focus any light into the facility so that it would not impact adjacent properties or land uses.

Energy Output

Question No. 27

How will the facility be dispatched and by whom?

Response

Notwithstanding anything to the contrary required for participation in a potential future PURA program, the BESS will be operated in response to direction from ISO-NE's dispatch instructions. Those instructions will be based on bids and offers submitted by the Project and will permit the Project to respond to ISO-NE price signals regarding the needs of the wholesale electricity

Question No. 28

When would the facility be dispatched (actively and passively) and for what duration?

Response

Notwithstanding anything to the contrary required for participation in a potential future PURA program, the facility will be operated in response to direction from ISO-NE's dispatch instructions. Those instructions will be based on bids and offers submitted by the Project and will permit the Project to respond to ISO-NE price signals regarding the needs of the wholesale electricity system.

Question No. 29

Is the facility required to reserve any battery storage capability for backup power? Where would the backup power be used and by whom?

Response

Backup power for EMS and peripheral devices are provided from a UPS (uninterrupted power supply) powered by a separate dedicated battery. At this time, the Project is not designed or configured to provide third party back-up power or any service specific to one electric customer. The proposed BESS may hold power in reserve based on price signals provided by ISO-NE in energy and ancillary services markets.

Question No. 30

What is the cumulative efficiency of the discharge output (e.g.- the BESS can only discharge 90% of its stored capacity)?

Response

The Powin Pod AC Round Trip Efficiency (RTE), cumulative of charging and discharging at Beginning of Life is 86.34%, as measured at the Medium Voltage metering point which would be adjacent to the POI. The discharging only portion of the RTE is 96.45%. The BESS under normal operations is capable of fully discharging to 0% State of Charge.

Question No. 31

When would the facility recharge (ex. off-peak hours)? What factors are considered for the recharge interval? Explain.

Response

Long Hill Energy Center, LLC – the ISONE Market Participant, will determine when to charge and discharge the BESS based upon electrical needs of the grid. Some examples of charging use cases include energy arbitrage (charging when electricity supply is too high relative to electricity demand) or frequency response (charging in response to frequency deviation on the grid). According to Eversource, the Project may charge the BESS at any time and is not subject to any charging restrictions.

Question No. 32

What storage capacity losses are anticipated for ambient temperatures below freezing?

Response

No storage capacity losses are anticipated for below freezing temperatures. The thermal management system in each BESS container would maintain temperatures within acceptable idling or operating ranges. While the BESS is idling, the thermal management system would be powered from the grid.

Question No. 33

Referencing Petition p. 6, the maximum export capacity for the proposed BESS is 20 MW. How does EPE intend to maintain the export capacity at the point of interconnection over the lifetime of the project while accounting for electrical losses and battery degradation?

Response

We are planning for a small overbuild of the system capacity at the beginning-of-life for the Project. The additional energy balance is due to the following factors: electrical losses, ideal depth-of-discharge operating regions, battery degradation, and maintaining 20 MW at the Point of Interconnection (POI) for the lifetime of the project. Additionally, Appendix A in Exhibit A as proposed reflects the end-of-life system size after all augmented capacity has been installed at the end of 25 years. The proposed BESS is expected to have 4 hours of energy capacity. The battery capacity will fluctuate over the lifetime of the project as the batteries degrade, and additional capacity is added. Operating the project within Powin's recommendations, we can discharge and charge the battery between 0%-100% state of charge throughout the life of the project.

Question No. 34

Would all of the battery storage units be dispatched simultaneously and respond together to keep battery degradation equal across all of the units?

Response

Generally, yes, however, there are many parameters that dictate how the Energy Management System will charge/discharge the system to maintain optimal operating conditions.

Question No. 35

Would the BESS utilize power for cooling and heating of the battery packs? If yes, would this power source be from stored energy or from the local distribution system?

Response

All of the electricity needed to power the Project controls, communications, lights, HVAC, etc. will be powered via an auxiliary feeder from Eversource's distribution system.

Electrical Interconnection

Question No. 36

Explain why two electrical interconnections are required. Could the number of poles be reduced via the use of one electrical interconnection? Explain.

Response

The Facility Study will determine the final design requirements for the Points of Interconnection ("POI"), the required equipment, mounting specifications, final number of poles and layout. At this time, we are not able to reduce the number of poles without more guidance from Eversource. Based on feedback from Eversource, as part of the interconnection study process, the preferred interconnection at this location was to split the Project into two Points of Interconnection totaling 20 MW of interconnection capacity. Both feeders will connect to the Dooley 30k Substation. The driver behind the dual-POI approach is the rating of the existing transformer in the Dooley 30k Substation; Eversource determined during the Feasibility Study that the transformer could support a BESS capacity up to 20MW. However, it would need to be split between to 10MW feeders.

Question No. 37

Referencing Petition, Appendix A, Sheet OP-1, what is the length of each overhead interconnection route to the point of interconnection at Dooley Substation?

Response

The total length from the of the interconnection routes as show on Appendix A, Sheet OP-1 are approximately 476' and 486'. However, the end point within Dooley 30k Substation is not precise, Eversource will provide more details on how the project should interconnect to the substation during the Facility Study. Until the results of the Facility Study are provided, the route shown in Appendix A, Sheet OP-1 is our best approximation.

Question No. 38

Are there any restrictions or code requirements (e.g NESC) regarding how close the BESS and any associated equipment can be to the ROW and/or transmission lines or any related requirements, such as grounding, etc.?

Response

Yes, the BESS will be designed and engineered to be compliant with all relevant codes upon receipt of the Building Permit. The Project team does not anticipate this will materially change the design of the Project from what is proposed. The Project will coordinate with Eversource after the completion of the Facility Study to meet all Eversource requirements.

Question No. 39

Referencing Petition, Appendix A sheet SP-1, what are the primary and secondary line voltages of the seven proposed transformers?

Response

The primary line voltage (high side) of the MV transformers is 13.2kV. The secondary line voltage (low side) of the MV transformers is 900V.

Question No. 40

Provide the dimensions of the transformers and inverters (LxWxH).

Response

The transformer and inverter will be mounted on a metal frame called a skid. Transformer and Inverter Skid Dimensions: 19'10.5" L x 8' W x 9'5" H Powin Pod Dimensions: 19'10"" L x 8' W x 9'6"" H". The skids would be placed on a foundation (pier or concrete slab) which would be approximately 12" above grade.

Question No. 41

Were any concerns raised by Eversource during the January 17, 2023 Feasibility Study referenced on p. 9 of the Petition? Did the March 8, 2023 report have any recommendations?

Response

During the scoping meeting after the completion of the Feasibility Study and in the Feasibility Report, Eversource identified a Transformer Upgrade would be needed if the project were to charge during peak load conditions. Eversource also identified a solution to avoid the transformer upgrade if the project was willing to limit charging to 3MW during peak load conditions. We accepted the condition to limit charging to 3MW during peak load conditions before proceeding to the System Impact Study.

Question No. 42

Referencing Petition p. 9, what is the status of the System Impact Study? Provide the results of this study if available.

Response

The Feasibility Study was completed in March 2023 and indicated that the local distribution grid could support the current size of 20 MW. The System Impact Study is in progress and expected to be complete in August 2025. We cannot therefore share any results at this time. The Facility Study has not yet started.

Question No. 43

Referencing Petition p. 9, when does EPE anticipate the facility study will begin?

Response

Approximately 30 business days after the completion of the System Impact Study.

Question No. 44

Referencing Petition Appendix A Sheet SP-1, What is the height of the utility poles above ground level after installation? Provide the typical horizontal distance between each pole.

Response

Standard Utility Pole Height is 35 feet above grade. The proposed Utility Pole spacing is also 35 feet.

Question No. 45

Which poles would be utility-owned, and which poles would be EPE-owned?

Response

The utility poles would be for disconnect switch, metering, turning, & recloser and the customer poles would be for disconnect switch & metering.

Question No. 46

Describe the equipment to be located on each pole.

Response

While the Facility Study will determine the final design requirements for the Points of Interconnection (POI), the assumption, based on guidance from utility shown in the site plans, is for 6 poles per POI. The utility poles would be for disconnect switch, metering, turning, & recloser and the customer poles would be for disconnect switch & metering. All poles shown on the site plan, except for any required turning poles, would be supporting utility-owned or customer-owned equipment.

Question No. 47

Would the facility be able to automatically disconnect from the grid in the event of a fault or other electrical disturbance? Explain.

Response

The Project will be designed to automatically disconnect from the grid in the event of a fault or other electrical disturbance via a breaker/recloser. Prior to the commercial operation date, the BESS will be tested for automatic shut off capability for a variety of system conditions to meet Eversource and ISONE electrical requirements. Additionally, through the use of an Energy Management System the BESS will be designed and tested to shut down or disconnect from the grid automatically if/when the system conditions match the Emergency Shutdown criteria.

Each battery enclosure can be disconnected from the grid and be de-energized independently via remote or locally operated switches and disconnects. This allows for the performance of typical scheduled or corrective maintenance on the system such as battery module troubleshooting, inspections, etc. In the event of an emergency the system will take pre-programed steps to mitigate the risk of a thermal runaway event. For example: halting charging/discharging operations, operation of HVAC system, de-energize & disconnection etc. Additionally, there are several electrical safety systems such as fuses and circuit breakers to mitigate against faults or shorts in the enclosure to prevent a fire.

Public Health and Safety

Question No. 48

Would the project comply with the current National Electrical Code (NEC) and the National Electrical Safety Code (NESC)? What codes and standards apply to battery storage facilities?

Response

This Project is designed and will be constructed in compliance with all applicable codes and standards in place at the time of the building permit application is filed. Currently these codes and standards include but are not limited to:

- 2022 Connecticut State Building Code (CSBC)
- 2020 National Electrical Code (NEC) with CT Amendments
- 2022 Connecticut Fire Safety Code (CFSC)
- Section 1207: Electrical Energy Storage Systems (ESS)
- NFPA 855: Standard for the Installation of Stationary Energy Storage Systems (2020)
- 2022 Connecticut State Fire Prevention Code (CSFPC)

Question No. 49

Would a crane be required for construction? If so, would FAA notice for use of the crane be required?

Response

Yes, a crane will be required for the construction of this BESS. EPE's general contractor will file and coordinate with the FAA on all appropriate notices and approvals prior to construction.

Question No. 50

Referencing Petition Exhibit D-Equipment Specifications, would the optional aerosol fire suppression system be installed within the battery cabinets? Are aerosols currently recommended as battery fire suppression media?

Response

EPE does not intend to utilize the optional aerosol-based suppression system within the units of the BESS. Furthermore, in the rare event a battery fire occurs, direct suppression of that battery fire is not recommended due to the unique fire hazards associated with lithium-ion batteries. The effectiveness of currently available aerosol-based fire suppression systems has yet to be validated through large-scale fire testing. While these systems may be capable of extinguishing early-stage fires in non-battery ancillary electrical components within an enclosure, aerosolizing agents are not effective at suppressing a fire event stemming from thermal runaway. In fact, field observations suggest that aerosolizing agents increase the risk associated with a thermal runaway event.

Applying water directly to a BESS unit experiencing thermal runaway is also not recommended as that approach may generate water run-off concerns and the potential for water damage to non-involved batteries. Industry guidance advises that batteries should be allowed to burn while exposure protection (usually through application of water to adjacent units/areas) is provided when required. If manual firefighting tactics are used, water is considered the preferred agent for managing lithium-ion battery fires, suppressing nearby combustibles/vegetation, cooling nearby exposures and controlling smoke.

Question No. 51

What types of fire suppression media can be applied directly to a battery fire? Is there a concern with runoff and cleanup caused by fire extinguishment?

Response

Applying water or other media directly to a BESS unit experiencing thermal runaway is also not recommended as that approach may generate water run-off concerns and the potential for water damage to non-involved batteries. Industry guidance advises that batteries should be allowed to burn while exposure protection (usually through application of water to adjacent units/areas) is provided when required. If manual firefighting tactics are used, water is considered the preferred agent for managing lithium-ion battery fires, suppressing nearby combustibles/vegetation, cooling nearby exposures, and controlling smoke.

If water or media were to be applied during an emergency, any tributary runoff from the battery container area would be captured by the constructed stormwater management basin which has volumetric storage capacity. Following any emergency response event, water and soil in the stormwater basin will be tested for contaminants. If there is any contamination above allowable limits set forth by state and/or federal agencies, the water and soil in the stormwater basin will be treated as needed.

Data collected through sampling at real world incidents, as well as ESRG at our test site over the past seven years have shown that runoff water from ESS incidents pose minimal risk both to human health and the environment. Results have shown this water has similar contaminants and traits of water runoff from other non-ESS structural fires.

Question No. 52

What are the typical causes of a battery fire at a BESS facility? What is the typical duration of a battery fire before it self-extinguishes? What is the reason for longer duration fires?

Response

Multiple layers of safety are incorporated into the design of any BESS proposed today, including EPE's proposed Project. The design and implementation of redundant safety features are incorporated into a BESS to prevent a thermal runaway event; this redundancy includes, but is not limited to, a battery management system, thermal management system, passive fire barriers, and 24/7 monitoring to prevent a full enclosure fire event. In the rare event of a thermal failure, a fire may result if heat is generated faster than can be dissipated, resulting in the ignition of the flammable electrolyte fluid, flammable gases or combustible insulation material within the battery cell. This thermal failure could trigger thermal runaway, a chain reaction in which a battery's temperature rapidly increases due to excessive heat generation. Lithium-ion battery fires typically stem from electrical abuse (i.e. short circuit, over-charging or over-discharging), mechanical abuse (i.e. excessive physical damage, exposure to excessive heat or water/humidity beyond the design of the battery / enclosure), or manufacturing defects of the battery cell(s). The duration of a battery fire is impacted by several factors including the size, capacity, battery chemistry and energy density of the BESS. For an individual battery cell level experiencing thermal runaway, fire duration typically is in the range of 1-3 minutes.

Furthermore, the goal of active and passive fire prevention features in a BESS are to reduce the likelihood of thermal propagation, which is the spreading of fire from one cell to another. Effective design, thermal barriers, and fire prevention features can slow or stop the spread of fire from cell to cell. This capability is evaluated using the Underwriters Laboratory (UL) 9540A test method which demonstrably shows the performance of a BESS under a possible thermal event. Limiting thermal propagation also plays an important role in further reducing the duration of a fire event.

Question No. 53

Referencing Petition p. 14, what mechanisms are in place to reduce the possibility of a fire from spreading from one battery unit to an adjacent battery unit?

Response

The ability of a BESS enclosure to limit the spread of a fire from one battery unit to an adjacent battery unit is evaluated using the UL 9540A test method. This standardized test is designed to evaluate the thermal runaway characteristics of a BESS enclosure. Key objectives of UL9540A include (i) determining whether a thermal runaway event in a single cell can propagate to adjacent cells, modules, or enclosures; (ii) assesses how well the system's design features prevent or contain the propagation of thermal runaway; (iii) evaluating the potential for fire or explosion during thermal runaway, including the energy release, flame intensity and heat spread; (iv) identifying the types and amounts of flammable gases released during thermal runaway; and (v) quantifying the heat produced during a thermal runaway event to evaluate the system's risk to the surrounding environment.

BESS enclosures utilize passive thermal barriers and unique venting designs to reduce heat impact on adjacent cells during a thermal runaway event and limit propagation. These barriers will differ from manufacturer to manufacturer; however, they are validated during UL 9540A testing.

In the event of a full enclosure experiencing thermal runaway, the non-combustible nature of BESS enclosures and typical equipment separation distances will aid in preventing a fire spreading from one BESS enclosure to another.

Question No. 54

Would the battery containers have a ventilation system to exhaust flammable gases? Would the facility have heat and gas sensors connected to a fire alarm system that could notify the fire department? Explain.

Response

Yes, the proposed BESS equipment includes an inlet fan, exhaust fan, and deflagration panels to facilitate the evacuation of flammable gases in the event if flammable gases are detected in the enclosure. Heat, gas, and smoke detectors connected to the Fire Alarm Control Panel will be installed throughout the enclosure. In the event one of these sensors detects a value that is abnormal the Battery Management System will take all preventative measures to reduce the risk of a thermal runaway event. East Point Energy will work in coordination with ESRG and the Middletown Fire Department to determine when and how the fire department should be notified of an emergency. The Fire Alarm System can be programed to notify the Middletown Fire Department in case of an emergency.

Question No. 55

Are there municipal fire water sources located in the immediate vicinity of the proposed project for response tie-in in the event of a fire? Explain.

Response

There is a municipal fire hydrant is located on Long Hill Road, approximately 600 feet to the North of the site driveway.

Question No. 56

What type of media and/or specialized equipment would be necessary to extinguish a battery storage/electrical component fire? Specifically, based on any history of fires at installed battery systems, is there specialized firefighting equipment necessary to extinguish a Lithium-ion battery fire? Would this media contain any polyfluoroalkyl substances (PFAS)?

Response

Energy storage systems, such as the Powin Pod, are designed and tested to limit propagation of fire from cell to cell, and enclosure to enclosure. As such, the industry standard and manufacturers recommendation, is to allow a fire within the BESS to continue to burn in a controlled fashion until all combustibles are consumed and all materials have enough time to cool. Should adjacent exposures require cooling, or there is an immediate threat to life safety, water through a fire department hose line can be used to cool surfaces or provide an effective means of controlling any off gases outside of the battery enclosure.

After all fire and smoke has visibly subsided, a thermal imaging camera can be used to actively measure the temperature of the unit from outside the enclosure. If the temperatures and visible smoke has subsided, a fire watch can be implemented to allow the enclosure to sit undisturbed for 24-48 hours, prior to approaching by a Subject Matter Expert to assess the damage and impact. These findings can be relayed to the Subject Matter Expert, or Incident Commander. These items are all equipment traditionally carried by a fire department and are not specific to BESS fires.

Data collected through sampling at real world incidents, as well as ESRG at our test site over the past seven years have shown that runoff water from ESS incidents pose minimal risk both to human health and the environment. Results have shown this water has similar contaminants and traits of water runoff from other non-ESS structural fires.

Question No. 57

Identify the coolant fluid (e.g. water and ethylene glycol), if applicable. Is the fluid toxic/hazardous? How often is this fluid replaced? Would this fluid have a containment system and low-level detection system?

Response

An Ultra Long-Life Coolant will be used in the Chiller, please see; Appendix N – Material Safety Data Sheets (MSDS) for details. This coolant is hazardous to human ingestion. It is an irritant when in contact with the skin and eyes. The coolant is flammable and is considered an environmental contaminant. A containment system is not planned. Please refer to the Attachment B Draft Spill Prevention, Control, and Countermeasure (SPCC) Plan.

Question No. 58

Referencing Petition Exhibit F, in the event of a refrigerant leak, is there is a low-level detection system and/or alarm to warn of the leakage? Would the refrigerant be topped off in the event of a leak?

Response

According to Appendix M – Powin Pod Project Manual; the Chiller uses a compressed refrigerant R410A. R410A has a low acute toxicity if inhaled and is an irritant if exposed to skin or eyes. Additionally, the dehumidifier uses a compressed refrigerant R134A. According to Appendix N the MSDS – R134A Refrigerant is toxic if inhaled and is an irritant if exposed to skin or eyes. These refrigerants are compressed gases and will evaporate rapidly if a leak were to occur. The refrigerant would need to be replaced if a leak were to occur.

Question No. 59

Referencing Petition page 19 of Appendix F-ESA Phase 1 Report-, what is the type and quantity of insulating oil within each transformer? Do the transformers have a leak-detection system or a low level alarm?

Response

The transformer uses a dielectric heat transfer fluid made from 100% vegetable oil for use in electrical transformers and other electrical equipment. Each transformer holds approximately 695 gallons of oil. Vegetable-based dielectric oil provides improved fire safety over mineral oils. The oil is readily biodegradable with over 99% biodegradation within 28 days. The oil is non-hazardous and non-toxic in soil and water. The vegetable-based oil-filled medium voltage transformers are equipped with port sensors that include a low oil level trip and alarm when oil drops below the minimum level required, which would alert the operations team to potential issues and to perform a visual inspection.

Under normal operating conditions there should not be any release to the environment. However, in the case of an accidental release to the environment the appropriate spill response measures will be taken per the site-specific SPCC plan to ensure that any oil that escapes is appropriately mitigated in accordance with the SPCC plan. The measures will help to mitigate the potential for the vegetable oil entering any catch basins, wetlands, or streams in the area. Any oil that infiltrates soils onsite is biodegradable, non-hazardous, non-toxic and will be cleaned up in accordance with the site-specific SPCC plan. Any oil on impervious surfaces will properly be cleaned up in accordance with the site-specific SPCC plan. All soiled absorbent materials and collected oil will be disposed of in accordance with all State and Federal regulations and the site-specific SPCC Plan.

Question No. 60

Submit a site-specific Fuel Storage and Spill Prevention Control Plan for site construction and operation with worker training and contact information including, but not limited to, regulatory agencies, spill cleanup contractors, and emergency responders.

Response

See Attachment B.

Question No. 61

Are any existing structures located within 150 feet of any of the battery cabinets? If so, identify such structures and provide the distances/directions from the nearest battery cabinet.

Response

There is a Communication Shelter 149 feet from the nearest BESS unit. The Communication Shelter is located inside the existing wireless facility compound to the south of the Project Site.

Question No. 62

Please respond to the following:

a) Would smoke from a battery unit fire be considered hazardous and require notification to state and local authorities?
b) Would smoke from a battery unit fire require area residences to stay in place or evacuate? If yes, who would determine if these actions are necessary and who ensures notifications have been made?
c) Would the final Emergency Response Plan contain a map with addresses of all properties requiring evacuation and/or isolation for certain types of emergencies? What methodology was used to determine the size of the evacuation and isolation

zones?

d) What type of emergency would require the evacuation of all persons downwind of the BESS? To what distance from the BESS would evacuation take place in the event of a fire?

e) Provide an aerial image showing all properties within the evacuation and isolation zones.

Response

a) The exact composition of smoke from a battery unit fire can vary drastically based on the specific chemistry of the battery, state of charge, and stage of the fire. Common gases found in smoke from BESS fires include Hydrogen, Carbon Monoxide, Carbon Dioxide, and Hydrogen Cyanide. This is like other fires in the built environment, including those involving electrical infrastructure.

The State of Connecticut Regulation of DEEP Concerning Release Reporting Regulations sections 22a-450-1 to 22a-450-6 define the release reporting requirements of a reportable material. Smoke from a battery unit fire does not meet any of the reporting criteria thresholds. As such ESRG is not aware of any required notifications to state.

b) ESRG firmly believes that fire departments must act out of an abundance of caution to protect their communities, and events requiring shelter-in-place or evacuation orders are not limited to, nor unique to BESS. While ESRG does not recommend these actions as an automatic response, Fire Department Incident Commanders must use the information at hand to make strategic decisions as needed.

Laboratory studies and experiments continue to produce research results on air quality and gas release during BESS failures. While these research gaps are being closed, ESRG closely monitors data gathered from real world incidents. The

January 2025 fire incident in the Vistra Energy Storage Facility at Moss Landing Power Plant in California is the largest BESS fire in the history of the technology. From the early stages of the fire, for four days, the EPA established nine air monitoring stations. These included the site of the fire as well as surrounding communities, each selected to account for changes in wind and potential smoke spread. Monitoring throughout the incident, and for days after, found no readings that surpassed California's stringent human health standards. Similar results were found following a BESS fire in San Diego, CA in September 2024. Four days of air quality monitoring by San Diego County and third-party contractors found only "normal products of combustion of a structure fire and at levels considered by the National Institute for Occupational Safety and Health (NIOSH) and the Occupational Health and Safety Administration (OSHA) to be well below exposure thresholds.

c) ESRG firmly believes that fire departments must act out of an abundance of caution to protect their communities, and events requiring shelter-in-place or evacuation orders are not limited to, nor unique to BESS. While ESRG does not recommend these actions as an automatic response, Fire Department Incident Commanders must use the information at hand to make strategic decisions as needed. Smoke spread from any type of fire, including non-BESS fires such as vehicles, wildfires, and other structures in the built environment may impact adjacent properties. The degree of impact is largely dependent on the items burning, atmospheric conditions and scope of the fire. Fire Department Incident Commanders routinely analyze and assess this as part of the Incident Action Plan of any type of fire. DHS FEMA provides guidance for State, Local, Tribal, and Territorial Partners in their July 2019 document Planning Considerations: Evacuation and Shelter-in-Place.

d) ESRG firmly believes that fire departments must act out of an abundance of caution to protect their communities, and events requiring shelter-in-place or evacuation orders are not limited to, nor unique to BESS. While ESRG does not recommend these actions as an automatic response, Fire Department Incident Commanders must use the information at hand to make strategic decisions as needed.

Smoke spread from any type of fire, including non-BESS fires such as vehicles, wildfires, and other structures in the built environment may impact adjacent properties. The degree of impact is largely dependent on the items burning, atmospheric conditions and scope of the fire. Fire Department Incident Commanders routinely analyze and assess this as part of the Incident Action Plan of any type of fire. DHS FEMA provides guidance for State, Local, Tribal, and Territorial Partners in their July 2019 document Planning Considerations: Evacuation and Shelter-in-Place.

e) The recommended initial safety distance in the ERP is 100’ from the affected enclosure. There are no buildings or residences that would fall within this 100’.

<u>Question No. 63</u>

Referencing Petition Appendix D – Noise Assessment, will the system generate noise during charging of the facility, discharge of the facility, neutral conditions (i.e. neither charging nor discharging), or all three? Was the modeling performed for the worst-case scenario? What equipment and quantity of such equipment was modeled to generate Fig. 8-sound propagation model? Explain.

Response

Noise will be a concern only during discharging and charging of the BESS. While idling, the HVAC system may engage to maintain temperatures for battery health, but the load is substantially lower. The modeling was performed for the worst-case scenario, see Paragraph 4.2 of Exhibit 6 – Revised Noise Assessment.

Question No. 64

Is a gap proposed between the bottom of the solid wall and grade? What animal deterrents are in place for small animals, such as nesting birds, chewing rodents, etc.?

Response

No, the proposed noise barrier design does not have a gap between the barrier and the ground. There is no animal deterrent proposed.

Question No. 65

Would operation of the BESS cause discernible vibrations at off-site locations?

Response

No.

Question No. 66

Is there a standard or recommended minimum distance of a BESS to a publicly accessible area? Provide citation of such distance.

Response

The Connecticut State Fire Prevention Code (CSFPC) requires a minimum of 10 feet between BESS battery containers and lot lines, public ways buildings, stored combustible materials, hazardous materials, high-piled stock and other exposure hazards not associated with the electrical grid.

Question No. 67

What are the industry Best Management Practices for Electric and Magnetic Fields at battery storage facilities?

Response

In North America most electricity is transmitted as alternating current (AC) at a frequency of 60 Hz (i.e., the current alternates direction 60 times per second), where 60 Hz is located on the extremely-low-frequency (ELF) portion of the electromagnetic spectrum. Since electric power is transmitted at this frequency, the electric and magnetic fields (EMF) produced by the generation of 60-Hz electricity are commonly referred to as power-frequency EMF. Since electricity is ubiquitous in modern society, EMF from the generation, transmission, and use of electricity is the most common source of these fields in a person's daily environment—there is a background EMF level in most locations where people spend time. The background EMF level results from the electrical appliances, equipment, and wiring in our homes and workplaces, as well as the transmission lines bringing electricity to our area, and the distribution lines bringing electricity to homes and businesses. The top panel of the Figure below illustrates typical magnetic-field levels in a number of scenarios: 1) ambient background; 2) away from and near appliances in homes; 3) at the edge and within a distribution or sub-transmission line ROW; 4) at the edge and within a high-voltage transmission line ROW; and 5) in two different occupational environments. The bottom panel of the Figure below illustrates typical electric-field levels for these same scenarios.

As noted above, all electrical devices are sources of EMF. Magnetic fields, specifically, are generated when current flows through conductors, electrical wiring, and electrical devices. Since magnetic fields rely on the flow of current, magnetic-field levels will vary depending on the amount of electricity flowing through an object. In the case of transmission and distribution lines, magnetic-field levels therefore vary based on electricity demand, which can change from day to day, week to week, and season to season. Magnetic fields are measured in units of milligauss (mG).

A property of magnetic fields is that they are not blocked by conducting objects and pass through most materials. Magnetic-field levels, however, diminish with increasing distance from the source and the magnetic-field levels from transmission and distribution lines, generally decrease in proportion to the square of the distance from the source.

Health-Based Guidelines from Scientific Organizations:

General guidelines have been established by two scientific organizations that regularly review the research on EMF—the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the International Committee on Electromagnetic Safety (ICES)—to protect health and safety. The limits in these guidelines are meant to protect against known effects of EMF exposure that occur at very high field levels; these are short-term, reversible, acute effects, and are not known to cause long-term damage or health outcomes. The WHO recommends adopting these ICNIRP and ICES guidelines (WHO, 2007). Table 1 summarizes the exposure guidelines developed for the general public, as well as for workers in occupational settings.

Table 1. ICNIRP and ICES guidelines for 60-Hz EMF exposure

Agency	**Exposure Scenario**	**Exposure (60 Hz)**	
		Electric Field	**Magnetic Field**
ICNIRP*	Occupational	8.3 kV/m	10,000 mG
	General Public	4.2 kV/m	2,000 mG
ICES†	Occupational	20 kV/m	27,100 mG
	General Public	5 kV/m‡	9,040 mG

* ICNIRP (2010).

† ICES (2019)

‡ Within power line ROWs, the guideline is 10 kV/m.

World Health Organization (WHO). Environmental Health Criteria 238: Extremely Low Frequency (ELF) Fields. Geneva, Switzerland: World Health Organization, 2007.

International Commission on Non-ionizing Radiation Protection (ICNIRP). ICNIRP Guidelines on Limits of Exposure to Static Magnetic Fields. Health Physics 96(4):504-514; 2009.

International Commission on Non-ionizing Radiation Protection (ICNIRP). ICNIRP Statement—Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). Health Physics 99:818-836, 2010.

International Committee on Electromagnetic Safety (ICES). IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields 0 Hz to 300 GHz. IEEE Std C95.1-2019 (Revision of IEEE Std C95.1-2005/Incorporates IEEE Std C95.1-2019/Cor1-2019/Cor 2-2020). New York: IEEE, 2019.

Question No. 68

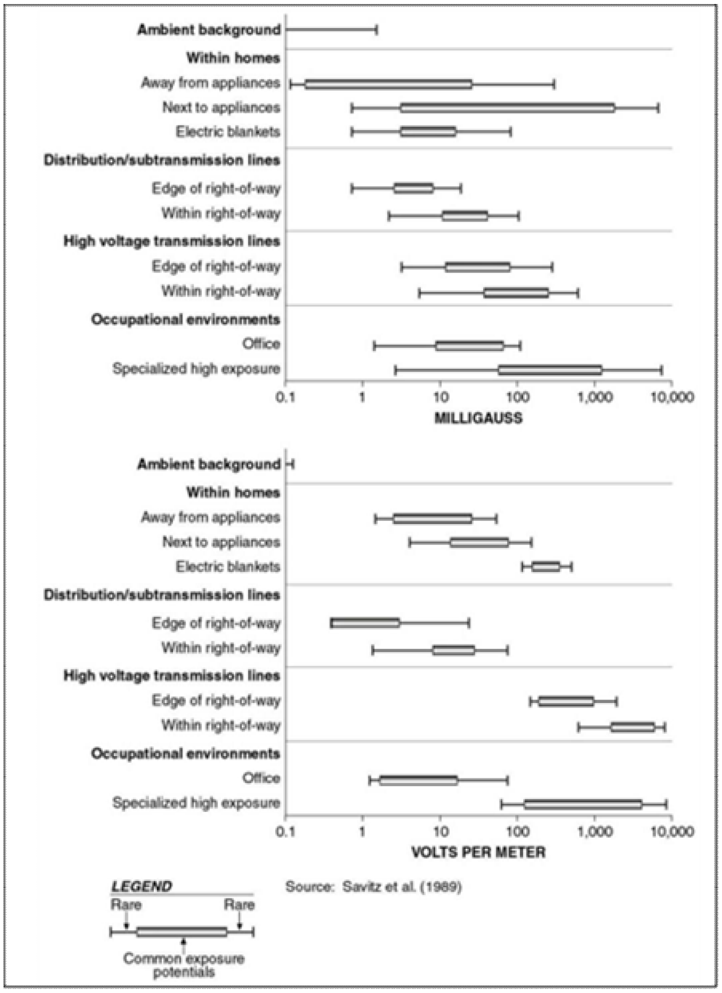
Referencing Petition p. 14, would the proposed facility materially affect AC magnetic fields at the property lines? Explain.

Response

All Project elements are hundreds of feet from the nearest residential neighborhood. EM field levels from Project-related elements at these distances are expected to be low and well within the range of background EM fields. At these distances, Project-related EM field levels also are expected to be significantly lower than health-based exposure guidelines for the general public established by the International Commission on Non-ionizing Radiation Protection and the International Committee on Electromagnetic Safety (ICNIRP, 2009, 2010; ICES, 2019). Scientific and health organizations that have reviewed the research on EM fields and health have been consistent in their overall conclusions that exposure to EM fields at the levels experienced in our everyday environment do not cause or contribute to adverse health effects in adults or children.

During operation, electromagnetic (EM) fields of varying frequencies from the Project will surround: 1) the direct current (DC) battery banks; 2) the DC lines connecting the battery banks to the power inverters; and 3) the alternating current (AC) power inverters that convert between DC and AC power.

Most Project-related sources of 60-Hz electric fields are entirely contained inside metallic or insulated coverings inside the boundaries of the Project fence. Therefore, the Project will not be a significant source of 60-Hz electric fields outside the Project boundaries.



Please see references in the response to question 67.

Question No. 69

Would the facility design comply with Underwriters Laboratories (UL) 9540A methodology and include different compartments to prevent a fire from spreading to adjacent battery cells?

Response

UL 9540 is a safety standard developed by Underwriters Laboratories (UL) for Energy Storage Systems (ESS) and equipment. It provides a framework for ensuring the safety and reliability of ESS, covering aspects like electrical, thermal, and fire safety, as well as system performance and documentation.

UL 9540A refers to a test method used to evaluate the fire and explosion risks associated with thermal runaway in battery energy storage systems. It assesses how a system behaves during a fire event, providing data for manufacturers, fire departments, and building codes to ensure safer designs and practice.

The Project will be designed to comply with all aspects of UL9540A.

Question No. 70

Do the battery packs have hermetic seals? If yes, please respond to the following:

a) Are the battery hermetic seals inspected after shipment/installation at the site? Who verifies that the equipment is not damaged?
b) What is the expected lifespan of the hermetic seals?
c) If the seals are damaged or deteriorated, is the entire battery unit replaced, or are the seals replaced?

Response

a) Yes, each of these hermetic seals are contained within rigid metal cases. There are multiple checks performed as part of the manufacturing designed to ensure these seals are robust and reliable. Once the IP67 modules are sealed, it is impractical to check every cell on the project site. Battery cells will be fully integrated into the BESS enclosures upon delivery to the Project site. "Bad" cells, whatever the problem, are detected via sensors once the BESS enclosures are electrically connected. Cell voltage, current, impedance, temperature, and capacity are monitored via the Battery Management System. Any deviation from normal operating conditions of any of these cells would be identified and addressed as part of normal maintenance throughout the life of the project.
b) 25 years
c) If the seals are damaged or deteriorated the cells will be replaced.

Question No. 71

Would each battery unit have fuses and/or circuit breakers that would isolate a battery unit during an abnormal event? Would the facility be remotely monitored with the ability to disconnect a given battery unit or the entire facility from the grid if necessary?

Response

Each battery enclosure can be disconnected from the grid and be de-energized independently via remote or locally operated switches and disconnects. This allows for the performance of typical scheduled or corrective maintenance on the system such as battery module troubleshooting, inspections, etc. In the event of an emergency the system will take pre-programed steps to mitigate the risk of a thermal runaway event. For example: halting charging/discharging operations, operation of HVAC system, de-energize & disconnection etc. Additionally, there are several electrical safety systems such as fuses and circuit breakers to mitigate against faults or shorts in the enclosure to prevent a fire.

Question No. 72

If the proposed facility is disconnected from the grid, would the battery containers still be energized and a shock hazard?

Response

Each battery enclosure can be disconnected from the grid and be de-energized independently via remote or locally operated switches and disconnects. This allows for the performance of typical scheduled or corrective maintenance on the system such as battery module troubleshooting, inspections, etc. In the event of an emergency the system will take pre-programed steps to mitigate the risk of a thermal runaway event. For example: halting charging/discharging operations, operation of HVAC system, de-energize & disconnection etc.

Additionally, there are several electrical safety systems such as fuses and circuit breakers to mitigate against faults or shorts in the enclosure to prevent a fire.

Question No. 73

Submit a plume analysis for the proposed facility that examines potential battery vent gas release scenarios from a thermal runaway event.

Response

See Attachment C.

Question No. 74

Describe how the proposed facility would comply with the Council's White Paper on the Security of Siting Energy Facilities, *available at*: https://portal.ct.gov/-/media/CSC/1_Dockets-medialibrary/Docket_346/whiteepprFINAL20091009114810pdf.pdf . Would safety signs be located on the facility fence?

Response

BESS project security is very similar to methods employed for transmission substations and includes the use of a locked security fence and recording security cameras. The project will comply with the state compliance regulations as described under Compliance on page 4 of the White Paper on the Security of Siting Energy Facilities. Safety placards would be placed on the external fence as required.

NFPA 855 requires that outdoor battery energy storage system enclosures be clearly marked with signage to ensure visibility and safety for emergency responders and personnel. According to Section 4.1.8 of the standard, signage must be durable, weather-resistant, and placed in a conspicuous location on or adjacent to the enclosure. The sign must include the type of battery technology used (e.g., lithium-ion), a warning about potential hazards such as fire or explosion, and emergency contact information.

Environmental Effects and Mitigation Measures

Question No. 75

Are there any wells on the site or in the vicinity of the site? If so, how would EPE protect the wells and/or water quality from potential construction and operational impacts?

Response

There are no wells located on the Project site and public water is available to all residential properties within 500-feet of the site. The nearest private well parcels, located over 500-feet to the east, are located along the eastern side of Dooley Pond within the Cooper Beach Drive residential subdivision. A Public Water Supply Watershed Protection Program has been developed due to a portion of the western side of the site located within a public water supply associated with the Laurel Brook Reservoir. This program satisfies the Connecticut Department of Health's General Construction Best Management Practices for Sites within a Public Drinking Water Supply Area (July 2014). See Attachment D Public Water Supply Protection Program.

Question No. 76

What measures would EPE take to capture and treat any firewater runoff, if necessary? Would runoff discharge into the stormwater detention basin?

Response

Applying water or other media directly to a BESS unit experiencing thermal runaway is also not recommended as that approach may generate water run-off concerns and the potential for water damage to non-involved batteries. Industry guidance advises that batteries should be allowed to burn while exposure protection (usually through application of water to adjacent units/areas) is provided when required. If manual firefighting tactics are used, water is considered the preferred agent for managing lithium-ion battery fires, suppressing nearby combustibles/vegetation, cooling nearby exposures, and controlling smoke.

If water or media were to be applied during an emergency, any tributary runoff from the battery container area would be captured by the constructed stormwater management basin which has volumetric storage capacity. Following any emergency response event, water and soil in the stormwater basin will be tested for contaminants. If there is any contamination above allowable limits set forth by state and/or federal agencies, the water and soil in the stormwater basin will be treated as needed.

Question No. 77

Provide an assessment of the potential impacts of a battery fire on the Laurel Reservoir and the Municipal drinking water storage tank.

Response

The risk that a battery fire at the proposed BESS may impact the Laurel [Brook] Reservoir and the municipal drinking water storage tank is minimal due to several mitigating factors incorporated in the project design.

First, project site has been engineered to manage and control all stormwater, erosion, and sediment transport, and, in the event of a fire, firefighting runoff, which will be discharged to the east and directed away from the Laurel [Brook] Reservoir.

Second, the Laurel Reservoir is located approximately 0.5 miles from the project site. Historical environmental testing data collected from previous fire events closer to the site have shown that air, soil, and water quality remained within acceptable limits. This suggests a low likelihood of significant contamination at the reservoir, even in the event of a fire incident at the Battery Energy Storage System (BESS).

It is important to recognize that there are currently several other industrial uses closer to the Laurel [Brook] Reservoir than the proposed BESS and in some instances within the watershed of the reservoir. These existing uses pose a greater risk to the reservoir in the event of a fire incident. These close by industrial uses include an Eversource electrical substation, a recycling facility (Eco Waste), manufacturing operation (Zygo Corporation), and a food processing plant (Jarvis Production Corporation). In addition, two residential structures are located immediately adjacent to the reservoir and across the street from the municipal water tank and within the watershed of the reservoir. These uses pose an equal or even greater risk of impact (runoff and pollution) to the water supply system if a fire incident were to occur. Finally, to further safeguard the Laurel [Brook] Reservoir and the municipal drinking water Storage tank, water quality monitoring will be conducted during and after any potential "incident" at the BESS. Should monitoring indicate that a fire at the BESS impacted water quality in the reservoir or stored in the existing tank, a certified environmental remediation firm will be promptly engaged to develop and implement a remediation plan.

Question No. 78

How would fire suppression water/or media be contained during an emergency to ensure it does not run off into nearby wells or permeate into nearby aquifers?

Response

Referencing interrogatory 75. There are no wells located on the property and the nearest private well is over 500 feet to the east on the eastern side of Dooley Pond.

Applying water or other media directly to a BESS unit experiencing thermal runaway is also not recommended as that approach may generate water run-off concerns and the potential for water damage to non-involved batteries. Industry guidance advises that batteries should be allowed to burn while exposure protection (usually through application of water to adjacent units/areas) is provided when required. If manual firefighting tactics are used, water is considered the preferred agent for managing lithium-ion battery fires, suppressing nearby combustibles/vegetation, cooling nearby exposures, and controlling smoke.

If water or media were to be applied during an emergency, any tributary runoff from the battery container area would be captured by the constructed stormwater management basin which has volumetric storage capacity. Following any emergency response event, water and soil in the stormwater basin will be tested for contaminants. If there is any contamination above allowable limits set forth by state and/or federal agencies, the water and soil in the stormwater basin will be treated as needed.

<u>Question No. 79</u>

Referencing Petition Appendix A, EA, p. 19, provide the total acreage of tree clearing required for the proposed project. Of that acreage of tree clearing, indicate how many acres would be cleared and grubbed versus cleared only (i.e. not grubbed).

<u>Response</u>

Approximately 1.73 acres will be cleared and grubbed. Approximately 0.23 acres will be cleared only.

<u>Question No. 80</u>

Please submit photographic site documentation with notations linked to the site plans or a detailed aerial image that identify locations of site-specific and representative site features. The submission should include photographs of the site from public road(s) or publicly accessible area(s) as well as Site-specific locations depicting site features including, but not necessarily limited to, the following locations as applicable:

For each photo, please indicate the photo viewpoint direction and stake or flag the locations of site-specific and representative site features. Site-specific and representative site features include, but are not limited to, **as applicable**:

1. wetlands, watercourses and vernal pools;
2. forest/forest edge areas;
3. agricultural soil areas;
4. sloping terrain;
5. proposed stormwater control features;
6. nearest residences;
7. Site access and interior access road(s);
8. utility pads/electrical interconnection(s);
9. clearing limits/property lines;
10. mitigation areas; and
11. any other noteworthy features relative to the Project.

A photolog graphic must accompany the submission, using a site plan or a detailed aerial image, depicting each numbered photograph for reference. For each photo, indicate the photo location number and viewpoint direction, and clearly identify the locations of site-specific and representative site features show (e.g., physical staking/flagging or other means of marking the subject area).

The submission shall be delivered electronically in a legible portable document format (PDF) with a maximum file size of <20MB. If necessary, multiple files may be submitted and clearly marked in terms of sequence.

<u>Response</u>

Please see Attachment E Long Hill Photo Log.

Facility Construction

Question No. 81

Has a geotechnical study been completed for the site to determine if site conditions support the overall Project design? If so, summarize the results. If not, has the Petitioner anticipated and designed the Project with assumed subsurface conditions? What are these assumed conditions?

Response

Infiltration testing and test pits revealed a hydraulic conductivity of approximately 4.3x10-3 in/hr. Borings revealed topsoil between 5-11 inches deep, fine to coarse sand and silt to a depth of approximately 48 inches, sand with some silt and gravel to a depth of 96-inches. Groundwater was encountered in in one of the borings at approximately 7.2 feet deep (at approximately elevation 304). Based on initial findings we do not anticipate encountering ledge rock during construction.

Question No. 82

Has EPE met with the DEEP Stormwater Division and/or submitted an application for a General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities from the Department of Energy and Environmental Protection? If yes, please describe any recommendations, comments or concerns about the project provided by the Stormwater Division and when an application was filed.

Response

EPE has not yet met with the DEEP Stormwater Division nor has it applied for a DEEP Stormwater General Permit but intends to do so prior to construction. Once received, a copy of the Stormwater General Permit will be submitted to the Council.

Question No. 83

Referencing Site Plan T-1 where will excess cut be disposed of?

Response

Excess cut will be transported offsite to a location, decided by the contractor at a future date.

Question No. 84

Would any blasting be required to develop the site or stormwater features?

Response

Based on the infiltration testing completed for the stormwater basin, no ledge rock was encountered. However, additional testing will be completed during the building permit process to confirm whether ledge rock is present. Based on the initial findings, the need for blasting is not anticipated.

Question No. 85

The construction hours on Petition p. 12 and Site Plan GN-1 do not match. Clarify. Provide the estimated duration of construction.

Response

Construction activities would be expected to occur 7:00AM to 6:00PM Monday through Friday and Saturday between the hours of 8:00 a.m. and 5:00 p.m. but may occur outside of these hours to meet Project needs.

Facility Maintenance/Decommissioning

Question No. 86

Provide the following information:

a. What is the anticipated annual degradation of battery storage capacity?

b. At what remaining battery capacity is replenishment recommended? Estimate the number of years before the batteries would require replacement?

c. What is the estimated cost of replenishment?

<u>Response</u>

a) While battery degradation is non-linear, the average degradation over a 25-year lifetime is ~1.5% per year.

b) Industry standard practices suggests 60% state-of-health ("SOH") is the end of life for the batteries. Based on expected project operation, 60% SOH may not be reached during the 25-year project life. We expect to = add new battery capacity, or augment the BESS, as needed per commercial considerations. However, this is subject to final system design and operation of the facility. Augmentation is not the replacement of old battery cells.

c) Given the timing of replenishment is far in the future, it is difficult to derive an estimate today, especially considering macroeconomic factors (e.g. inflation, tariffs and global supply chains) are likely to change drastically between now and when the equipment will be purchased.

<u>Question No. 87</u>

What minimum snow depth would require removal within the BESS compound? At what height could snow block the airflow to the chiller and/or electronic compartments?

<u>Response</u>

EPE's general practice is to remove snow within the BESS area when it reaches 18 inches or when maintenance is needed. The low side of the Air Inlet for the Chiller system is 18 inches from the bottom of the container.

Question No. 88

At what intervals and how would vegetation management occur?

Response

Vegetation management will be outlined in the Operation and Maintenance Plan. It is expected that tree trimming, and other landscaping activities will occur once a year or more often as needed.

Question No. 89

At what time intervals would the transformers, inverters and switchgear need replacement?

Response

The standard life span for a MV transformer is 20-30 years. The standard life span for an inverter is 10-15 years. The standard life span for switchgear is 20-30 years

Question No. 90

Would the BESS be taken out of service for Operations and Maintenance Plan inspections? Approximately how frequently and for how long would the BESS be out of service?

Response

The Project will be able to remain in operation during routine inspections. Routine inspections may occur about once a month. The Operation and Maintenance Plan will outline the frequency of specific maintenance and inspection activities.

ATTACHMENT A

SC5000UD-MV-US

Power Conversion System

HIGH YIELD

- Advanced three-level technology, max. efficiency 99%
- Wide DC voltage operation window, full power operation at 1500V

SMART O&M

- Modular design, easy for maintenance
- High protection degree, easy for outdoor installation
- Optional C5 anti-corrosion degree, adjust to applications close to the sea

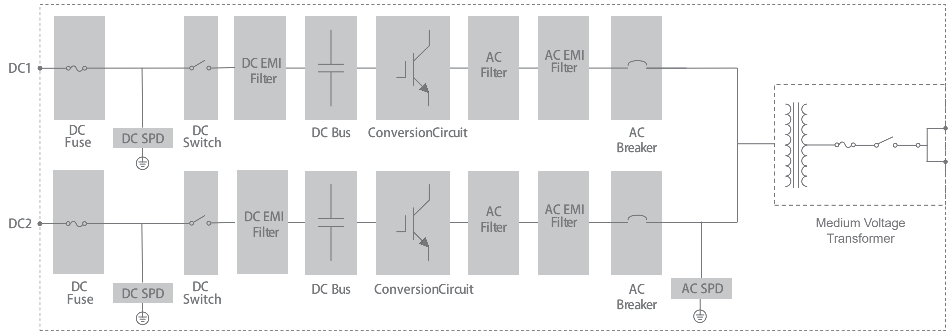
FLEXIBLE APPLICATION

- Bidirectional power conversion system with full four-quadrant operation
- Compatible with high voltage battery system, low system cost
- Battery charge & dis-charge management and black start function integrated

GRID SUPPORT

- Compliant with UL1741, IEEE1547, UL1741 SA, Rule 21
- Fast active/reactive power response
- L/HVRT, FRT, soft start/stop, specified power factor control and reactive power support

CIRCUIT DIAGRAM



SUNGROW
Clean power for all

System Type	SC5000UD-MV-US
DC side	
Max. DC voltage	1500 V
Min. DC voltage	1300 V
DC voltage range	1300 – 1500 V
Max. DC current	2 * 1958 A @ 40 ℃
No. of DC inputs	2
AC side (Grid)	
AC output power	5000 kVA @ 40 ℃ (104 ℉)
Max. AC output current	3208 A @ 40 ℃ (104 ℉)
Nominal AC voltage	900 V
AC voltage range	792 – 990 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
Harmonic (THD)	< 3 % (at nominal power)
Power factor at nominal power / Adjustable power factor	>0.99 / 1 leading – 1 lagging
Adjustable reactive power range	-100 % – 100 %
Feed-in phases / AC connection	3 / 3-PE
AC side (Off-Grid)	
Inverter port nominal AC voltage	900V
Inverter port AC voltage range	792 – 990 V
AC voltage distortion	< 3 % (Linear load)
DC voltage component	< 0.5 % Un (Linear balance load)
Unbalance load Capacity	100 %
Nominal Voltage frequency / Voltage frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
Efficiency	
Inverter max. efficiency	99.00%
Transformer	
Transformer rated power	5000 kVA
Transformer max. power	5000 kVA
LV / MV voltage	0.9 kV / 34.5 kV
Transformer vector	Dy1 or Dy11
Transformer cooling type	ONAN (Optional: KNAN)
Oil type	Mineral oil (PCB free) or degradable oil on request
Protection	
DC input protection	Load break switch + fuse
Inverter output protection	Circuit breaker
AC output protection	Load break switch + fuse
Surge protection	DC Type II / AC Type II
Grid monitoring / Ground fault monitoring	Yes / Yes
Insulation monitoring	Yes
Overheat protection	Yes
General Data	
Dimensions (W*H*D)	6058*2896*2438 mm 238.5''*114.0''*96.0''
Weight	18000 kg 39683 lbs
Degree of protection	TYPE 3R
Operating ambient temperature range	-35 to 60 ℃ (> 40 ℃ derating) -31 to 140 ℉ (> 104 ℉ derating)
Allowable relative humidity range	0 – 100 %
Cooling method	Temperature controlled forced air cooling
Max. operating altitude	1000 m (Standard) / > 1000 m (Optional)
Display	LED, WEB HMI
Communication	RS485, CAN, Ethernet
Compliance	UL1741, UL1741 SA, IEEE 1547, Rule 21, CSA C22.2 No.107.1-01
Grid support	L/HVRT, FRT, active & reactive power control and power ramp rate control, Volt-var, Volt-watt, Frequency-watt

SUNGROW
Clean power for all

MVS5000-LV-US

MV Turnkey Solution for PowerTitan 2.0 MVS Liquid Cooling Energy Storage System

NEW

Product Name	MVS5000-LV-US
MV transformer	
Rated power	5140 kVA
MV / LV voltage	34.5 kV / 0.69 kV
Transformer vector	Dy 1 (standard)
Windings	2 windings
Rated frequency	60 Hz
Impedance	9 % (± 7.5 % , IEEE tolerance)
Efficiency standard	99 % @ 100 % load
Material of winding (MV / LV)	Aluminum / Aluminum
Legged core design	3 Legged Core Design
High voltage configuration	Loop-feed, Dead Front
Overcurrent protection	Expulsion fuses in series with Partial-Range Current-Limiting Fuses
Temperature control method	KNAN
Insulation fluid	Degradable oil (standard)
Smart control cabinet	
Protection	AC Breaker
Surge protection	Type II
AC insulation detection	Support
Cooling method	Air cooling and HVAC
UPS	15 min (standard) 2 / 3 / 4 h (optional)
General data	
Dimensions (W * H * D)	6058 mm * 2896 mm * 2438 mm 238.5'' * 114.0'' * 96.0''
Weight	15300 (± 500) kg 33730 (± 1102) lbs
Cable entry	Bottom Entry
Degree of protection	Type 3S
Anti-corrosion degree	C4 (standard)
Operating ambient temperature range	-40 ˚C - 60 ˚C -40 °F - 140 °F > 40 ˚C (104 °F) derating (standard) ; > 45 ˚C (113 °F) derating (optional)
Operation humdity range	0 % - 100 % (non-condensing)
Maximum operation altitude	3000 m 9842.5 ft
Standard	UL891,IEEE C57.12.00,IEEE C57.12.80,IEEE C57.12.90
Communication	Ethernet, Optical fiber, RS485

* 15min UPS only supplies power for the control and communication devices in the MVS
** 2 / 3 / 4 h UPS supplies power for the control and communication devices in the the MVS, and the ventilation system in the battery container

ATTACHMENT B

Draft Spill Prevention, Control, and Countermeasure (SPCC) Plan

Long Hill Energy Center, LLC BESS

Long Hill Road
Middletown, Connecticut

Table of Contents

Introduction

This Draft Spill Prevention, Control, and Countermeasure (SPCC) Plan outlines the preliminary scope of work to prevent, respond and report oil spills and releases into the environment during construction. This draft plan was developed for the construction of a ±20 MW battery energy storage facility located at Long Hill Road in Middletown, CT.
It is recommended that a final site-specific plan be developed by the selected EPC or general contractor prior to construction.

This Draft SPCC Plan addresses the requirements of the EPA regulations specified in Title 40 of the Code of Federal Regulations (CFR). These regulations codified in 40 CFR Part 112 establish the procedures, methods, and equipment to prevent discharge of oil (i.e., petroleum oil and non-petroleum products) from non-transportation related onshore and offshore facilities into or upon the navigable waters of the United Stated or adjoining shorelines.

SPCC plans for facilities are prepared and implemented as required by the U.S Environmental Protection Agency (ESEPA) Regulation 40 CFR 112. A non-transportation-related facility is subject to SPCC regulations if:

- The facilities total aboveground storage capacity exceeds 1,320 gallons: or
- The facilities total underground storage tank capacity exceeds 42,000 gallons: and
- If, due to its location, the facility could reasonably be expected to discharge oil into or upon the navigable waters or adjoining shorelines of the United States

For this project, the proposed aboveground oil storage capacity is anticipated to exceed 1,320 gallons. Each transformer holds approximately 695 gallons of vegetable-based dielectric oil. The oil is readily biodegradable with over 99% biodegradation within 28 days. If State, Local or Federal regulations require secondary containment the MV transformers will be outfitted with the necessary containment built into the equipment skid. There is no proposed underground storage tank, and the facility is not expected to discharge oil into waters. A copy of the SPCC will be available for on-site review during normal working hours.

Pollution Prevention Standards

Potential Construction Site Pollutants

Pollutant-Generating Activity	**Pollutants or Pollutant Constituents**	**Locations on Site**
Equipment Re-fueling	Diesel Fuel, Gasoline	Staging Area
Leaking or Broken Hydraulic Lines	Hydraulic Oil	Construction Work Areas

Minor Equipment Maintenance	Diesel Fuel, Gasoline, Hydraulic Oil, Motor Oil, Coolant	Staging Area
Vehicle Accident	Diesel Fuel, Gasoline	Entire Site

The contractor shall adhere to the following spill response and material handling procedures:

Refueling and Material Storage

- All light duty construction support vehicles shall be fueled off site at a service station.
- Refueling of vehicles on site shall take place in a supervised manner to avoid any overfills.
- Refueling of vehicles or machinery shall take place on an impervious pad with secondary containment designed to contain petroleum fuel.
- Any refueling tanks and/or drums or other hazardous materials that must be kept on site shall be stored on an impervious surface utilizing secondary containment and be kept at least 100 feet from any wetlands or watercourses located on site.

Initial Spill Response Procedure

- Immediately stop operation and shut off all equipment.
- Remove any sources of ignition.
- Locate the source of the spill and contain and/or stop the spill from continuing.
- Once the spill is stopped or contained, follow any flow paths of the spill and prevent or contain any further release into sensitive environmental areas.
- Ensure that all contractors and subcontractors on site are notified of the spill.

Spill Clean Up

- Obtain the Spill Response Kit from the designated location on site.
- Place the absorbent materials directly on the spill.
- Continue to place absorbent materials around the spill to prevent any further release.
- Ensure that the spill is eliminated or isolated at the source.
- Determine the type and approximate amount of material that was spilled.
- Contact the appropriate Site contacts and local, state and/or federal agencies as required.
- Contact a disposal company to properly dispose of any contaminated materials.
- File a report on the incident.

Reporting

- Complete an incident report for each spill.
- Submit a completed report to local, state and federal agencies, as required.
- The Connecticut Department of Energy & Environmental Protection (DEEP), Emergency Response Unit should be contacted at: (860 424-3338, in the event of an emergency spill.

Site and Emergency Contact Information

Spill Coordinator
Name: TBD
Phone: TBD
Email: TBD

Connecticut DEEP (Spill Reporting Line, Emergency Response Unit)
Phone: 860-424-3338 or toll free at 1-866-337-7745 (24 Hr Line)

Local Emergency Contacts
Emergency - Dial 911

Fire Department:
Phone: 860-638-3250
Address: 169 Cross Street, Middletown, CT 06457

Police Department:
Phone: 860-437-2541
Address: 222 Main Street, Middletown, CT, 06457

Emergency Response Contractor
Name: TBD
Phone: TBD
Address: TBD

Subcontractor Certifications/Agreement

Project Number: ____

Project Title: ____

Operators: ____

As a subcontractor, you are required to comply with the Spill Prevention and Countermeasures Plan for any work that you perform on-site. Any person or group who violates any condition of the plan may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the plan. A copy of the Plan is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that would impact groundwater or stormwater resources must be identified and sign the following certification statement.

I certify that I have read and understand the terms and conditions of the Spill Prevention, Control, and Countermeasures Plan for the above designated project and agree to follow the practices described in the Plan.

This certification is hereby signed in reference to the above-named project:

Company: ____

Address: ____

Telephone Number: ____

Type of Construction Service to be Provided: ________________________________

____

____

Signature: ____

Title: ____

Date: ____

Company: ____

Address: ____

Telephone Number: ____

Type of Construction Service to be Provided: ___________________________________

____

____

Signature: ____

Title: ____

Date: ____

Reporting and Record Keeping

Date	Description of Activity when Spill was Discovered	Description of Remediation Measure and Location, Contacts Made, and CT DEEP Spill Notification Number	Follow Up Actions and Resolution/Remediation Details

ATTACHMENT C

Long Hill BESS Plume Study

HD-25007-Long Hill-Plume-1.0

May 9, 2025

Prepared for:

East Point Energy

By:

Anna Jensen
Kevin Marr, Ph.D. P.E.
Erik Archibald, Ph.D. P.E.

Hazard Dynamics LLC
PO Box 1967
Pflugerville, TX 78691 USA

Contents

1 Executive Summary

A plume study was conducted for the Long Hill BESS (battery energy storage system) site to determine toxicity hazards posed to nearby areas during possible battery failure scenarios. The study considers toxic species that can be released by Li-ion batteries during thermal failures. Computational fluid dynamics (CFD) models were utilized to simulate plumes resulting from theoretical battery failure scenarios. The modeled scenarios considered (1) a non-fire scenario in which battery vent gas is released, (2) a small fire scenario, and (3) a large fire scenario. The fire scenarios considered low and high wind conditions based on nearby meteorological data.

Based on the modeled scenarios, toxic gas species concentrations 2 m (6.6 ft) from ground level were estimated using Fire Dynamics Simulator (FDS), which is a CFD software developed by the National Institute of Standards and Technology (NIST) for fire modeling. A summary of the findings of the study is as follows:

- The fire scenarios with high wind conditions resulted in the highest modeled battery plume concentrations at 2 m (6.6 ft) from ground level. The modeled average carbon monoxide concentrations may cause serious health effects (exceed the AEGL-2 level) up to approximately 29 ft (8.8 m) from the burning enclosure in a large fire scenario with high winds. The modeled high wind speed was 18 mph (8 m/s), which is the 99th percentile wind speed for the Long Hill BESS site. For first responders who may be operating within this region, guidance for appropriate personal protective equipment (PPE) can be found in relevant Emergency Response Protocol (ERP) documents.
- Modeled carbon monoxide levels beyond the property line are below the AEGL-2 level. CO concentrations below the AEGL-2 level are not expected to result in serious health effects over a 30-minute exposure.
- The area immediately around the site is mostly fields, forested areas, and ponds. However, there are also populated areas nearby. Approximately 150 houses are located within a half-mile of the Long Hill BESS site, the nearest being about 357 ft away. Schools, offices, and industrial facilities are located within roughly a mile of the site. At these distances, CO levels are expected to be well below the AEGL-2 level.
- Hydrogen fluoride (HF) levels were not evaluated as HF was not measured during the UL 9540A testing for this system.
- Other toxic organic gases, such as volatile organic compounds (VOCs) make up only trace amounts of the battery vent gas. VOC release quantities are too small to exceed hazardous levels at any distance from the unit.

Note that this Executive Summary does not contain all of Hazard Dynamics' technical evaluations, analyses, conclusions, and recommendations. Hence, the main body of this report is at all times the controlling document.

2 Introduction

This report describes the results of a plume dispersion study conducted for the Long Hill BESS (battery energy storage system), which is being constructed for East Point Energy in Middletown, Connecticut. The Long Hill BESS site uses the Powin Pod for lithium-ion battery energy storage. The purpose of a plume study is to identify and quantify potential risks associated with toxic gases produced by a battery energy storage system under abnormal conditions.

Where appropriate toxicity data is unavailable, reasonable engineering assumptions will be made. These assumptions will be drawn from the available body of technical literature. This analysis was conducted using a set of probable worst-case scenarios based upon available test data such as UL 9540A reports and includes up to a fully-involved fire in a single unit.

This report will first provide background on the toxicity hazards of lithium-ion battery systems. Next, it will review the details of the Long Hill BESS site as well as the energy storage system itself. Finally, the report will evaluate possible toxic gas scenarios and their consequences.

This analysis relies on the following information:

- Plans for the Long Hill BESS site [1]
- Specifications for the Powin Pod system [2] [3]
- UL 9540A Unit test report for unit model Y104R04-314, TUV Rheinland (Shanghai) Co., Ltd. report number CN240QMQ 001 dated 6/24/2024 [4]

3 Background on Lithium-Ion ESS Toxicity Hazards

3.1 Toxicity Hazards

Toxicity hazards may exist alone or in combination with fire and explosion hazards. A significant amount of the gas released during thermal runaway is carbon monoxide (CO), which is toxic. Depending on the conditions, the combustion of battery gases may burn off some carbon monoxide or create additional carbon monoxide from partially reacted hydrocarbons. Smaller amounts of other toxic gases may also be released depending on the cell, whether the gases burn, and if water or other suppression agents are added. Experiments show that lithium-ion cells in thermal runaway may release hydrogen fluoride (HF), hydrogen chloride (HCl), hydrogen cyanide (HCN), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and other gases [5]. When the gases burn, some of the toxic components may be consumed, although others may be generated. Smoke from many fires, including battery fires, is considered hazardous. Smoke typically includes asphyxiant gases, irritant toxic gases, and particulate matter. The introduction of water to a fire may change the composition of the smoke and can create water runoff, which may also contain hazardous substances. The use of other fire suppression agents may also alter the toxic release profile [6].

3.2 Toxic Gases of Interest

Abuse and failure of lithium-ion cells may result in gas production inside of the cells. When enough gas is produced, a safety vent may open, or the cell package may rupture. The gas mixture released is flammable and toxic and is primarily made up of carbon monoxide (CO), carbon dioxide (CO_2), hydrogen (H_2), and an assortment of hydrocarbons. If ignited, the combustion of these gases can lead to a fire or an explosion.

When a lithium-ion cell is exposed to high temperatures such as those due to fire exposure or propagating thermal runaway, it produces toxic compounds. Plastic contained in the battery system may contribute to these toxic combustion products. Such products may include carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), hydrogen chloride (HCl), and hydrogen fluoride (HF). CO_2, H_2, and CH_4 are asphyxiant gases, or gases that can cause unconsciousness or death by suffocation because they displace oxygen in the air [5]. CO blocks the transport of oxygen by sticking to the hemoglobin in red blood cells. Poisoning by CO is often the major cause of death related to fire in which burns are not present [7]. Hydrogen cyanide (HCN) obstructs the function of mitochondria so that oxygen cannot be absorbed into the cells. Irritant gases include HF, HCl, SO_2, and NO_2. These gases have a toxic and irritating effect that can be significant even at very low concentrations. HCl is corrosive, highly irritating, and can cause severe injury to the respiratory tract if inhaled. SO_2 is extremely irritating and can form sulfurous acid when in contact with moisture. NO_2 and NO are especially irritating to the respiratory tract and lungs even at low concentrations. None of these irritants can be absorbed through the skin. HF, on the other hand, is not only severely irritating to the respiratory tract but can also penetrate skin and other tissues as the fluoride ion. When HF comes into contact with moisture, it can form hydrofluoric acid [8].

In evaluating harmful levels of toxic gases, it is helpful to reference levels known as IDLH (immediately dangerous to life or health) and AEGLs (acute exposure guideline levels). According to the Code of Federal Regulations, IDLH is defined as a concentration of any toxic, corrosive, or asphyxiant substance that poses an immediate threat to life, would cause irreversible or delayed adverse health effects, or would interfere with an individual's ability to escape from a dangerous atmosphere [8]. IDLH values were developed to address occupational exposures to chemicals and to help protect workers from acute or short-term exposures to high concentrations of some airborne chemicals that could result in undesirable health outcomes [9]. The AEGLs were developed by the EPA to define the health effects of a once-in-a-lifetime exposure to airborne chemicals. AEGLs are used by emergency responders when dealing with major chemical leaks, spills, or other exposures. AEGL concentrations are provided for different exposure times and health effect levels. Level 1 is discomfort or irritation, Level 2 is the onset of irreversible or serious health effects, and Level 3 describes life-threatening health effects [10]. Toxic gases related to battery energy storage systems along with their IDLH, AEGL-2, and AEGL-1 concentrations are shown in Table 1. The AEGL values presented in the table are based on an exposure time of 30 minutes, which is characteristic of how long someone evacuating might be exposed to a substance.

Table 1: Toxic chemicals that can be present during battery failure and concentrations of interest. The AEGL values shown are for a 30-minute exposure. (NR = Not recommended due to insufficient data)

Chemical	IDLH (ppm)	AEGL-3 (ppm)	AEGL-2 (ppm)	AEGL-1 (ppm)
Carbon Monoxide (CO)	1,200	600	150	NR
Carbon Dioxide (CO_2)	40,000	NR	NR	NR
Hydrogen Chloride (HCl)	50	210	43	1.8
Hydrogen Cyanide (HCN)	50	21	10	2.5
Hydrogen Fluoride (HF)	30	62	34	1
Nitrogen Dioxide (NO_2)	13	25	15	0.50
Nitric Oxide (NO)	100	NR	NR	NR
Sulfur Dioxide (SO_2)	100	30	0.75	0.20
Benzene (C_6H_6)	500	5,600	1,100	73
Toluene ($C_6H_5CH_3$)	500	5,200	760	67

4 Site and System Descriptions

4.1 Site Description

The Long Hill BESS project is a lithium-ion BESS facility that will be located in Middletown, Connecticut. The location of the site can be seen in Figure 1.

Figure 1: A map showing the location of the Long Hill BESS site. This image was taken from Google Maps 2025.

The project will be located on 9.4 acres of land and includes lithium-ion battery energy storage equipment [1]. The area immediately around the site is mostly fields, forested areas, and ponds. However, there are also populated areas nearby. Approximately 150 houses are located within a half-mile of the Long Hill BESS site, the nearest being about 357 ft away. Schools, offices, and industrial facilities are located within roughly a mile of the site. The site and its close surroundings are shown in Figure 2. Some significant nearby exposures and their approximate distances from the BESS enclosures are also shown in Figure 2.

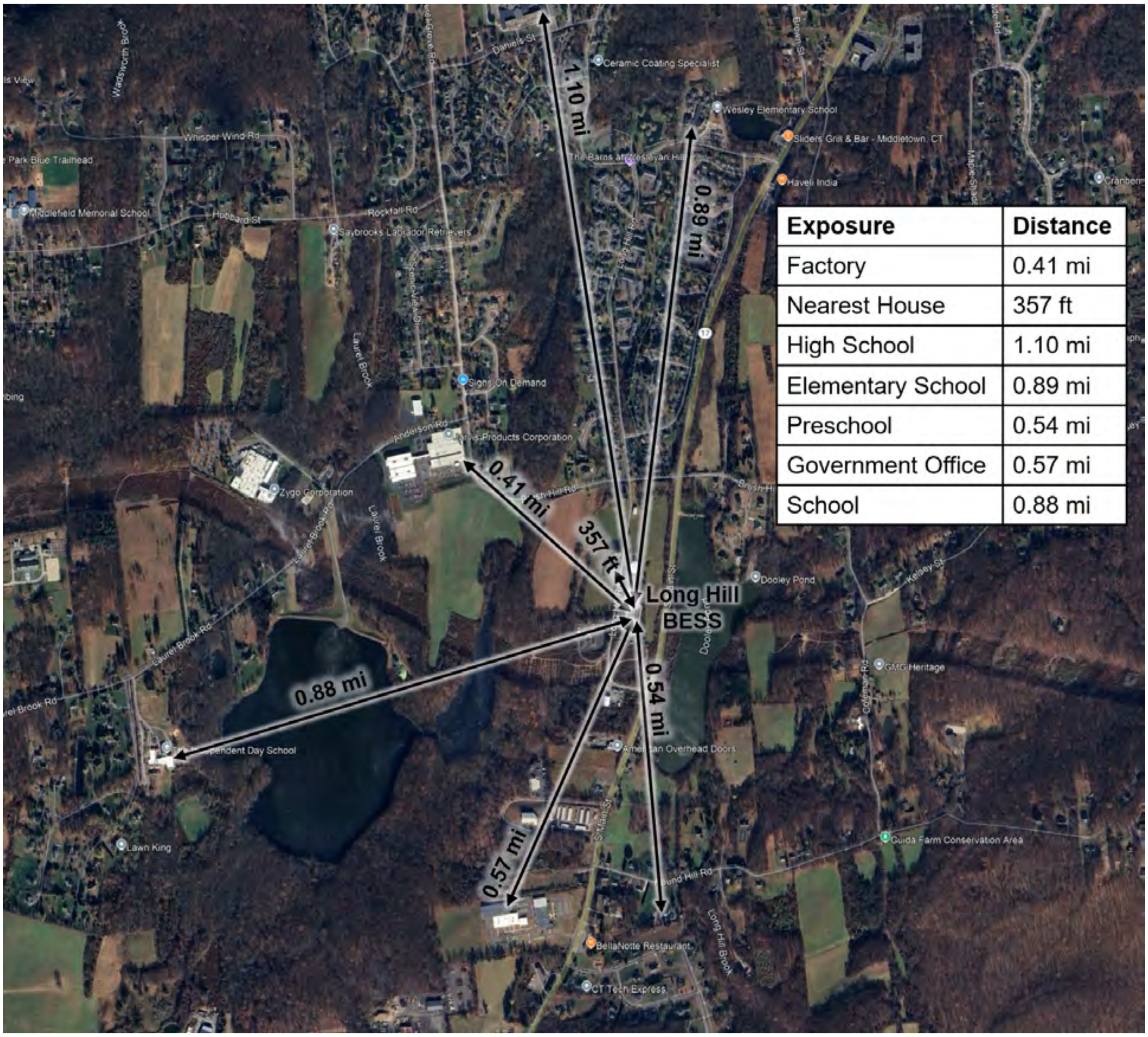


Figure 2: A satellite view of the Long Hill BESS site location and its surroundings. Some significant nearby exposures and their approximate distances from the BESS enclosures are also shown. This image was taken from Google Earth 2025

4.1.1 Typical Wind Conditions

In case of a toxic gas release, it is expected that the impacted area would be downwind of the site. Historical wind data was taken from the Meriden Markham Municipal Airport weather station, which is near the Long Hill BESS site. According to historical wind information from 1975 to 2024, the prevailing winds generally come from the northwest and south but may also come from the north (see Figure 3). The average wind speed is 6.1 mph or 2.7 m/s. Conditions are calm 31.1% of the time [11]. Additional wind data was analyzed to find the 99th percentile wind speed for use in the models. This wind speed was found to be 18 mph or 8 m/s for the Meriden Markham Municipal Airport weather station [12].

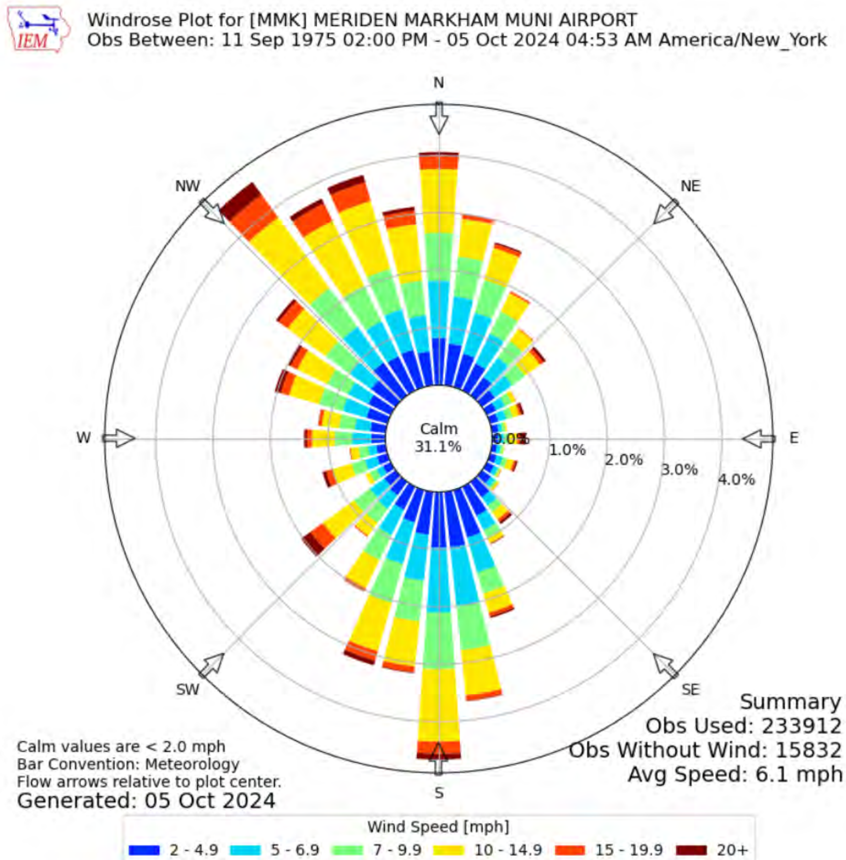


Figure 3: The wind rose for the Meriden Markham Municipal Airport weather station, which is near the Long Hill BESS site. This image was taken from the Iowa State University Iowa Environmental Mesonet website [11].

4.2 Energy Storage System Description

The Long Hill BESS project uses modular outdoor-rated Powin Pod battery units. These units contain REPT BATTERO Energy Co., Ltd. lithium-ion batteries installed in racks inside the enclosure. Each enclosure contains six racks that each contain eight liquid-cooled battery modules, for a total of 48 modules. The Powin Pod also includes a battery management system, an electrical cabinet, an environmental controls system, and a fire safety system. A Powin Pod with emergency ventilation features labeled is shown in Figure 4 [2].

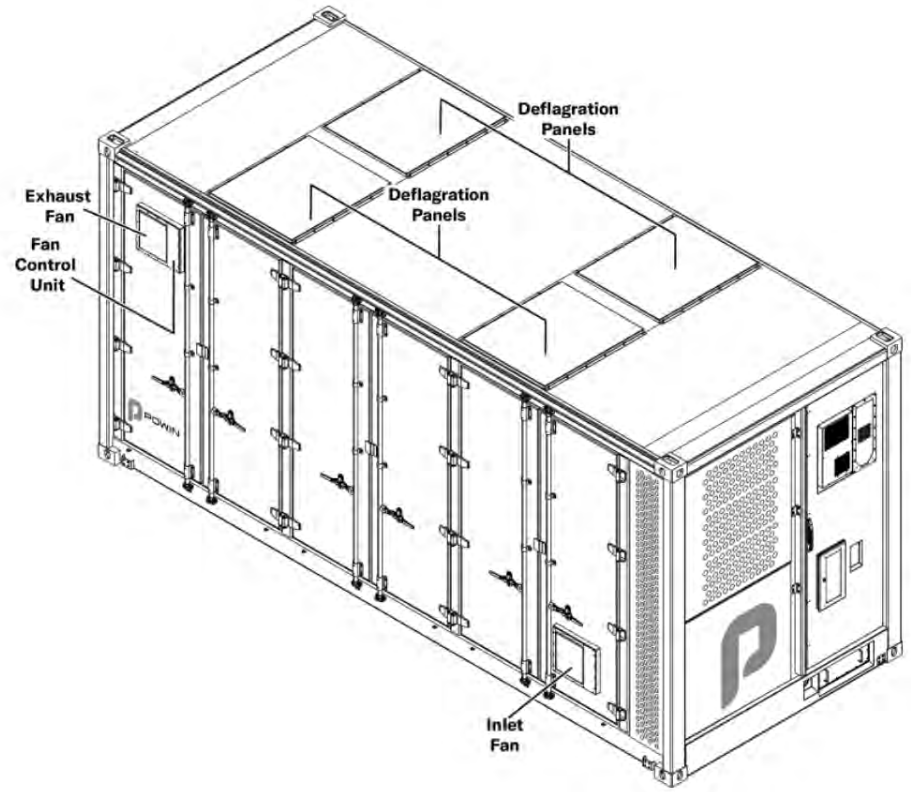


Figure 4: An image of a Powin Pod battery energy storage system with emergency ventilation features labeled. [2].

The Long Hill BESS will consist of seven groups of four enclosures each for a total of 28 enclosures. Figure 5 shows the configuration of a group of four Powin Pod enclosures, which is called a Pod Quad. The Long Hill BESS site also includes inverters and transformers. Figure 6 shows the planned layout of the site.

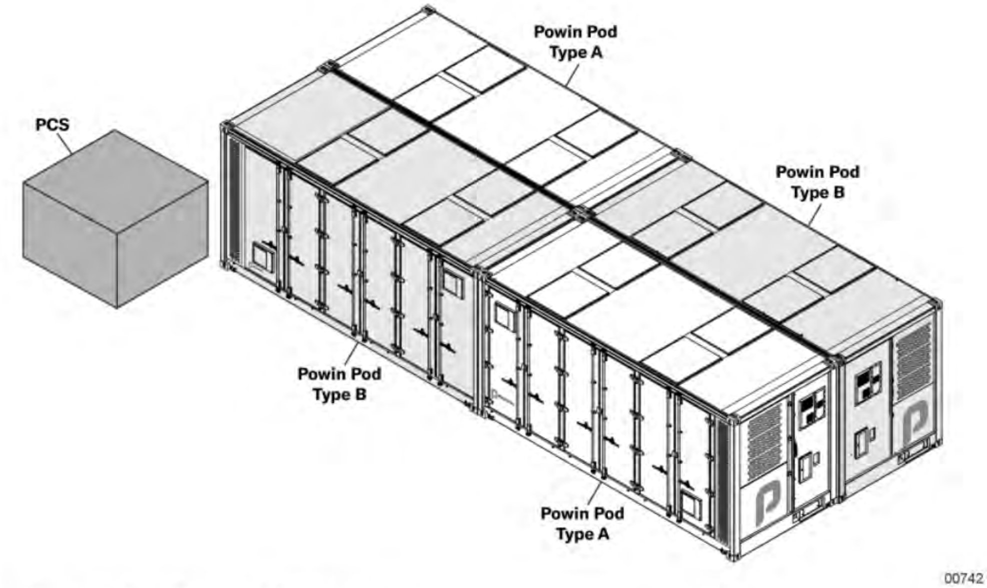


Figure 3. Pod Quad and PCS Layout

Figure 5: An image of a Pod Quad, which includes four Powin Pod enclosures [2].

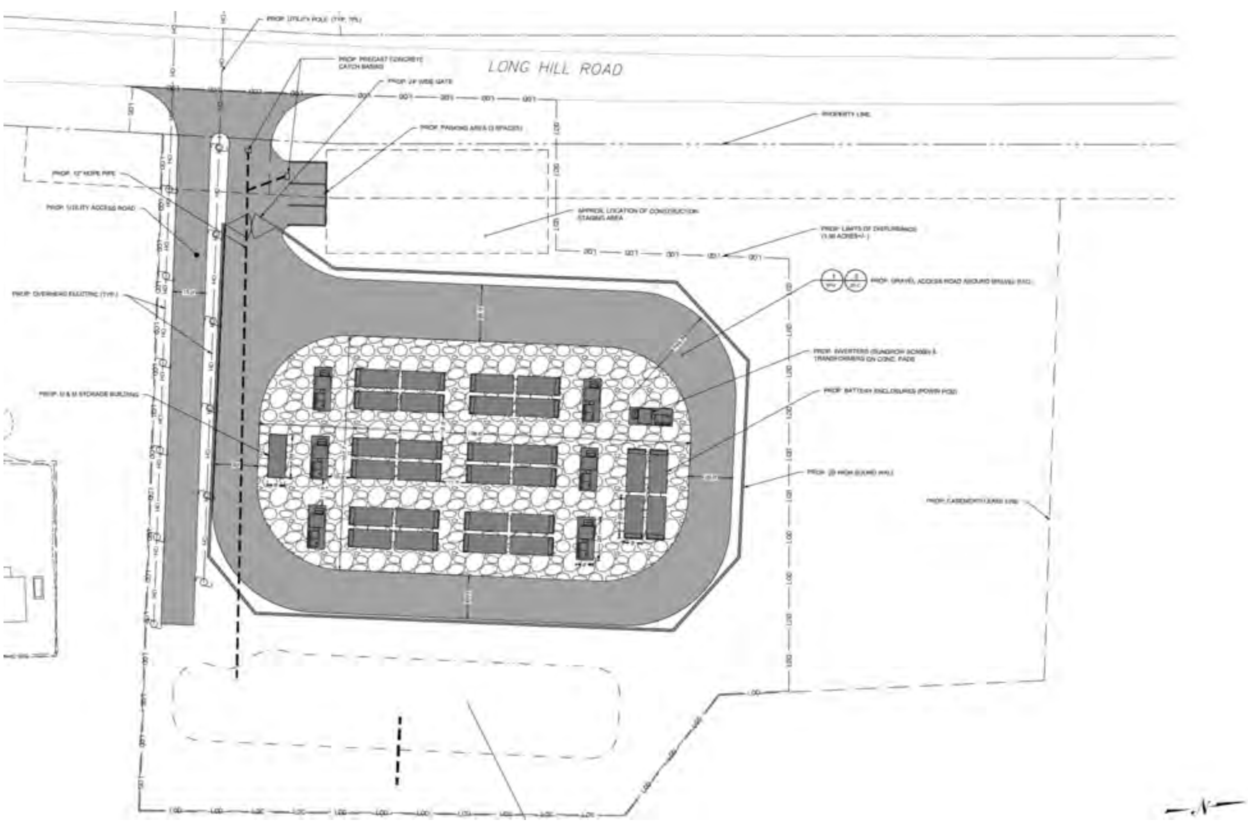


Figure 6: An engineering drawing indicating the planned layout of the Long Hill BESS site, including the battery enclosures, inverters, and transformers [1].

5 UL 9540A Test Results

This analysis is based on test data from UL 9540A test results. During this testing, a cell is forced into thermal runaway while the outcome is observed. Gases released from the battery or batteries during thermal runaway are captured and analyzed for select chemical species. Depending on the outcome of cell-level testing, additional testing at the module level and full unit level may also be required. For this plume analysis, only the UL 9540A unit-level test report was provided [4]. This report included information about the cells and modules as well as a summary of the unit-level test. The information and results from the unit test report are described in Sections 5.1 and 5.2.

Since UL 9540A is primarily concerned with fire and explosion hazards, typical UL 9540A gas measurements are focused on major combustible gases and combustion products, such as hydrogen, carbon monoxide, carbon dioxide, and various hydrocarbons. Typically, carbon monoxide is the most significant toxicity hazard among the measured gases due to a comparatively low IDLH value and relative abundance in most battery gas. The UL 9540A unit test report indicates that 188 L of gas was captured from a single cell. Of the gas captured, 10.095% by volume was carbon monoxide. This information, along with the remaining composition information, is listed in Table 3.

Cell-level gas composition information is collected by failing an individual cell inside of a sealed pressure vessel that is filled with an inert gas to prevent combustion. This method allows for the capture of the entire volume of emitted gas. Gas compositions from cell experiments are usually measured using a gas chromatograph (GC), which is typically more accurate than measurements taken from exhaust hoods during module and unit testing.

5.1 Cell and Module Information

Cell details and results from UL 9540A testing are provided in Table 2.

Table 2: Key cell properties as reported in the UL 9540A unit test report [4].

Parameter	Value
Cell Manufacturer	REPT BATTERO Energy Co., Ltd.
Cell Model	CB75
Cell Chemistry	LFP
Cell Nominal Voltage	3.2 V
Cell Capacity	314 Ahr
Volume of Gas Released	188 L
Lower Flammability Limit (LFL) at ambient temperature	7.7%
Lower Flammability Limit (LFL) at venting temperature	7.1%
Burning Velocity (Su)	0.688 $\mathrm{m/s}$
Maximum Pressure (P_{max})	0.798 MPa

When the CB75 cells go into thermal runaway due to external heating, they release a mixture of flammable gases. The vent gas composition for the cell, which was reported in the unit UL 9540A test report, is listed in Table 3.

Table 3: The gas composition for a cell as listed in the UL 9540A unit test report [4]. Model Volume Percent will be addressed in Section 6 later in this document.

Name	Formula	Experimental Volume Percent	Model Volume Percent
Carbon Monoxide	CO	10.095	10.095
Carbon Dioxide	$CO2$	24.614	24.614
Hydrogen	$H2$	54.373	54.373
Methane	$CH4$	5.480	5.480
Acetylene	$C2H2$	0.168	0
Ethylene	$C2H4$	2.838	2.838
Ethane	$C2H6$	0.804	0.804
Propyne	$C3H4$	0.011	0
Propene	$C3H6$	0.428	0
Propane	$C3H8$	0.324	1.796
C4 Total	$C4H10$	0.865	0

The REPT BATTERO Energy Co., Ltd. cells are located inside of module model Y104. Each module contains 104 cells in a 1P104S configuration [4]. The module setup was shown in the unit UL 9540A test report. Figure 7 shows the configuration of the thermocouples and the heater on the initiating cells, and Figure 8 shows the location of the initiating cells within the sub-module. In the module test, the initiating cells went into thermal runaway and propagated to one adjacent cell, for a total of three failed cells. Flaming and flying debris were not observed during the test.

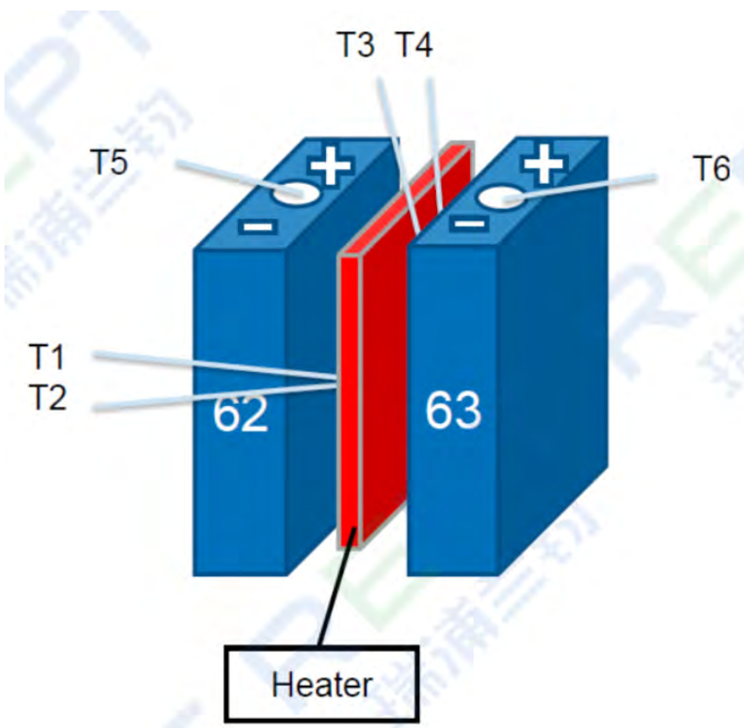


Figure 7: The configuration of the thermocouples and the heater on the initiating cells for the UL 9540A test. This image was taken from the UL 9540A unit-level test report [4].

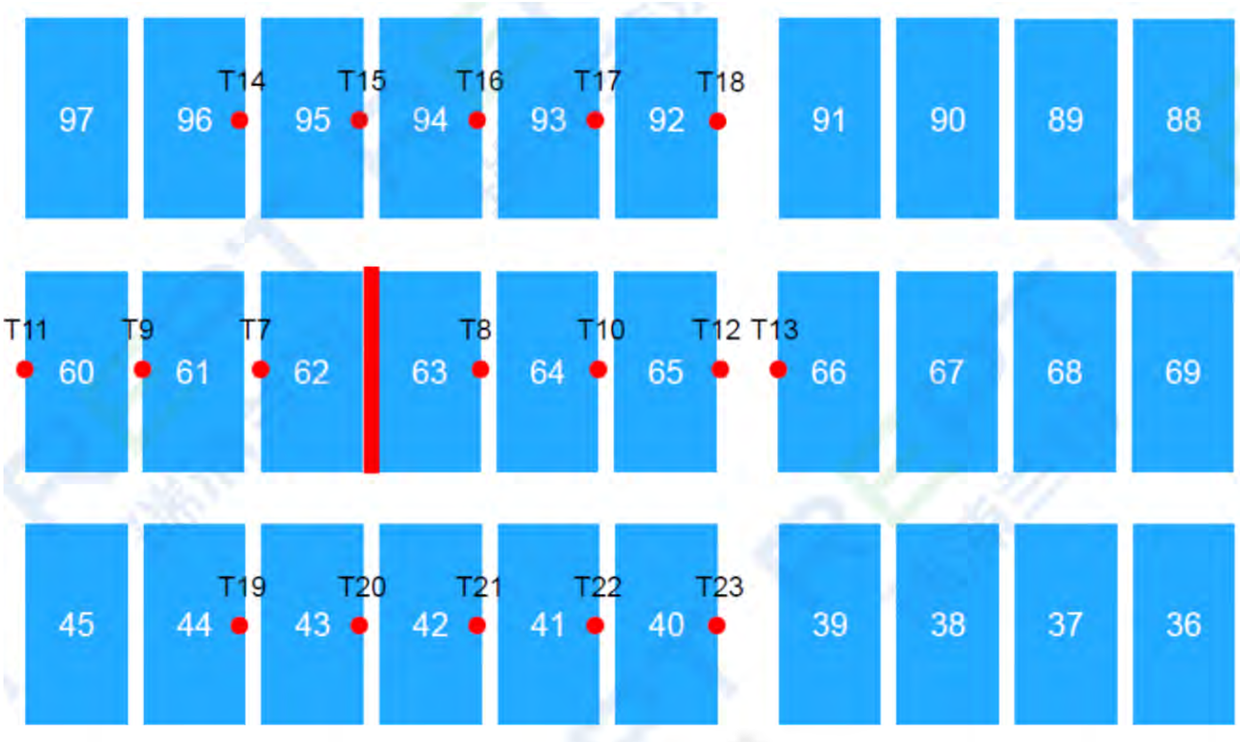


Figure 8: A diagram of the module setup for the UL 9540A test. This image was taken from the UL 9540A unit-level test report [4].

5.2 Unit Test

The UL 9540A unit test for unit model Y104R04-314 is described in TUV Rheinland (Shanghai) Co., Ltd. report CN240QMQ 001 dated 6/24/2024. In this test, a unit comprised of 4 modules was tested. The unit contained 416 individual cells [4]. The initiating module was configured identically to the module test. This module was then inserted into a full unit, which was placed in proximity to walls and target units. The configuration of the initiating unit is shown in Figure 9, a diagram of the test setup is shown in Figure 10, and a picture of the test setup is shown in Figure 11.

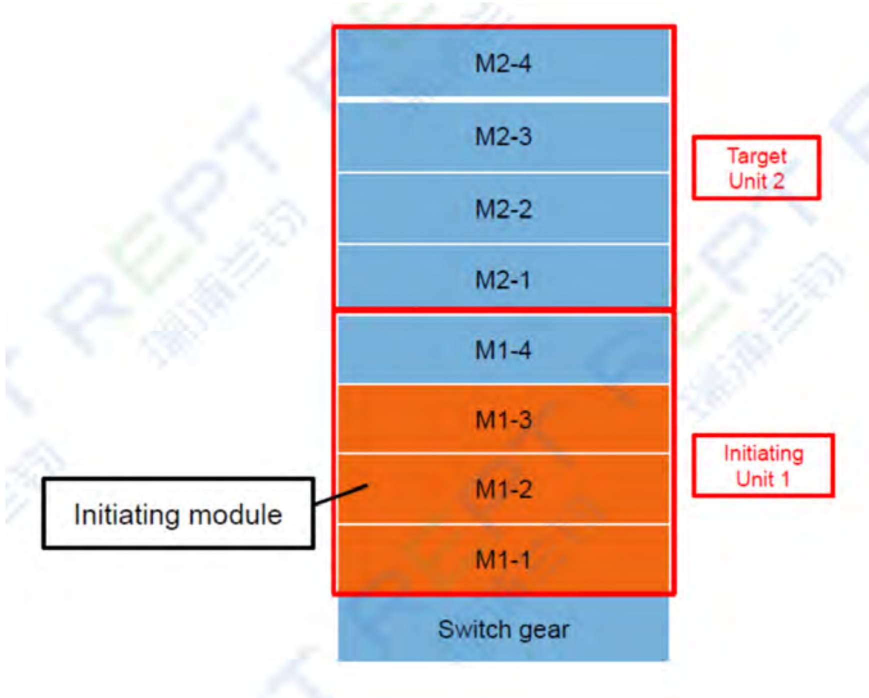


Figure 9: The initiating unit with the initiating module and target modules labeled. This image was taken from the UL 9540A unit-level test report [4].

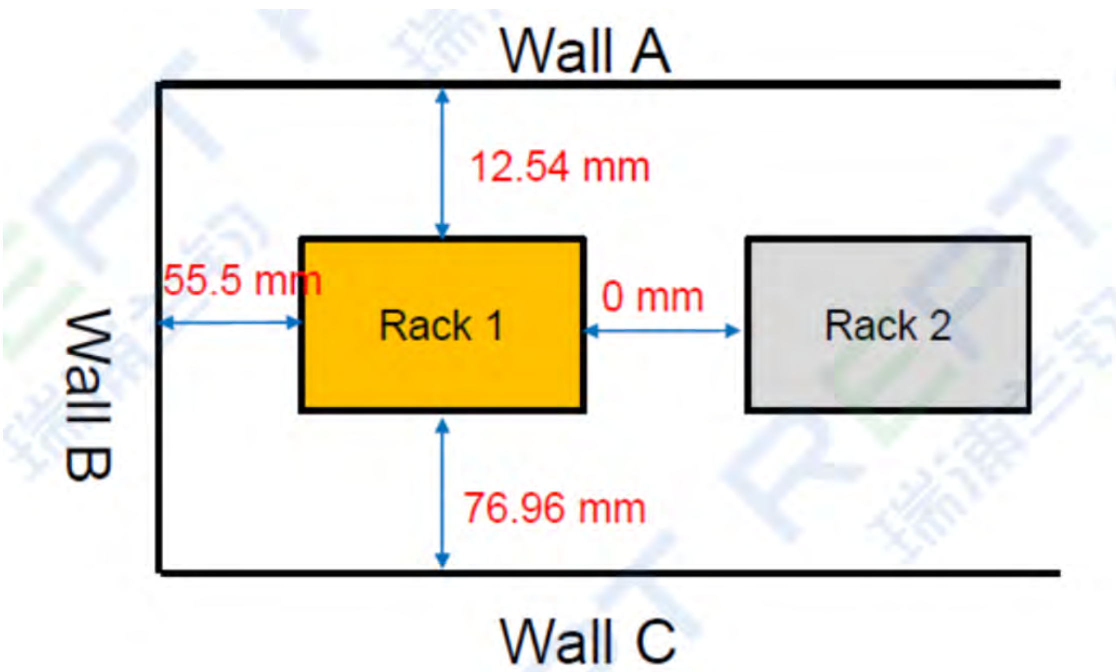


Figure 10: A diagram of the unit test setup. This image was taken from the UL 9540A unit-level test report [4].

Figure 11: A picture of the unit test setup. This image was taken from the UL 9540A unit-level test report [4].

Thermal runaway was initiated by activating the heater between cells 62 and 63 in the initiating module. Once thermal runaway began, the power to the heater was disconnected. Cells 62 and 63 both failed, and thermal runaway propagated to cell 61 for a total of three failed cells inside the initiating module. Thermal runaway did not propagate outside of the initiating module. Flaming, sparks, and flying debris were not observed during the test [4]. Figure 12 shows the time history for the thermocouples on the initiating cells, and Figure 13 shows the initiating module after the test.

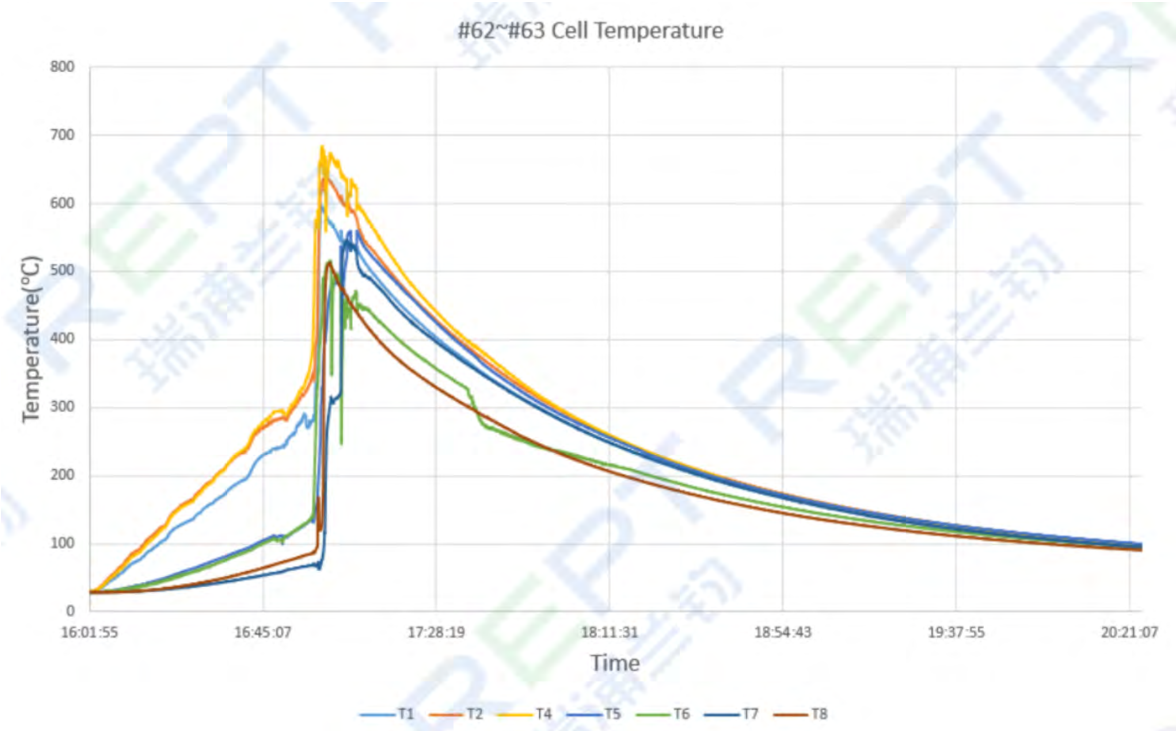


Figure 12: The temperature time history for the initiating cells from the UL 9540A unit test. This image taken was from the UL 9540A unit-level test report [4].

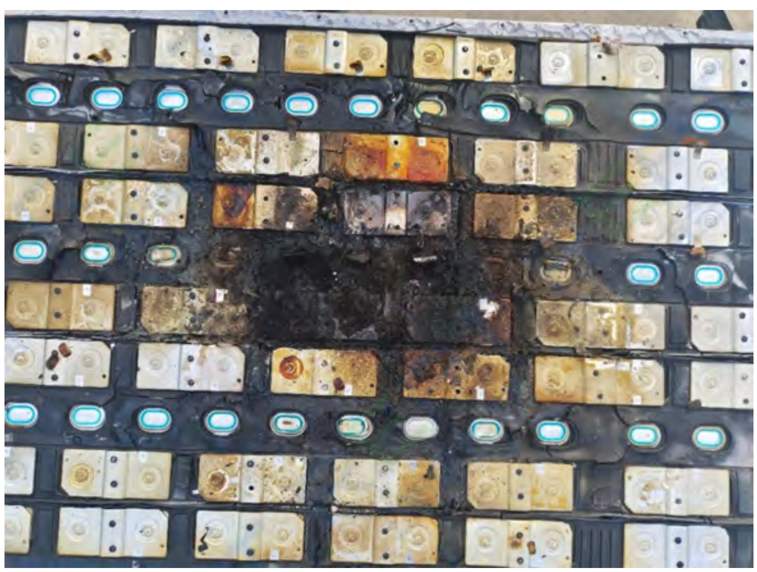


Figure 13: The internal contents of the module after the UL 9540A unit-level test. This image was taken from the UL 9540A unit-level test report [4].

6 Fire and Toxicity Modeling

Hazard Dynamics used data from the UL 9540A test report to conduct plume modeling for a number of different failure scenarios. These models included cases of varying wind conditions, differing levels of failure severity, and with or without burning.

Two different heat release rates (HRR) were used to represent two different sizes of fire. The large HRR of 31.2 MW represents a full enclosure burning. This value was calculated using cell, module, and unit information from the UL 9540A unit test [4]. In calculating the peak HRR used for the model, it was assumed that all cells and modules burned over the course of two hours (half an hour ramp up, steady burn for an hour, and half an hour ramp down). Flaming propagation between adjacent enclosures was not modeled as available UL 9540A test data did not demonstrate propagation between modules inside of a unit or between units. The small HRR of 3.12 MW was taken to be 10% of the large fire. This HRR was used to evaluate the consequences of a smaller fire in which the entire enclosure does not burn.

The non-fire scenario models the release of lithium-ion battery vent gas from a segment in the absence of burning. This scenario considers gas release without an active ventilation system. A gas release rate of 0.000554 kg/s was calculated using the overall time cells entered into thermal runaway during the unit-level test, the amount of gas released by a single cell, and the number of cells failed during the unit-level test [4]. The calculation can be found in the appendix of this report. This gas release rate approximates the average release rate expected from three failing cells as demonstrated in the unit-level test. Actual gas release rates may be slightly above or below this value during portions of the thermal runaway process.

Each scenario assumes a steady-state release and was modeled for 300 seconds. The scenarios are summarized in Table 4. The wind speeds used in the models will be discussed in Section 6.1.

Table 4: Long Hill BESS plume model scenarios.

Name	Wind Speed (m/s)	Mass Release Rate (kg/s)	HRR (MW)
Gas Release, Low Wind	1.5	0.000554	No Fire
Small Fire, Low Wind	1.5	0.188	3.12
Small Fire, High Wind	8	0.188	3.12
Large Fire, Low Wind	1.5	1.88	31.2
Large Fire, High Wind	8	1.88	31.2

For modeling purposes, the most significant components which account for more than 95% of the gas are modeled in the non-fire gas release mixture, while minor hydrocarbon elements are approximated as propane. The volume percents used in the model can be found in column four of Table 3.

6.1 Model Setup

Computational fluid dynamics (CFD) models of possible toxic plumes were created using Fire Dynamics Simulator (FDS) version 6.9.1. Fire Dynamics Simulator is a CFD software developed by the National Institute of Standards and Technology (NIST) for fire modeling. The code solves the Navier-Stokes equations using a large-eddy-simulation (LES) approach and is mainly intended for low-speed flows with an emphasis on smoke and heat transport from fires. The code has been extensively validated for a variety of scenarios involving fire, smoke, gas dispersion, and other transport phenomenon. The model uses grid sizes ranging from 0.25 m (9.8 in) to 2 m (6.6 ft) to capture both the flow near the source (starting 2 m from the enclosure) as well as the dispersion over a large flat downwind area up to 320 m (1050 ft) away from the source as shown in Figure 14.

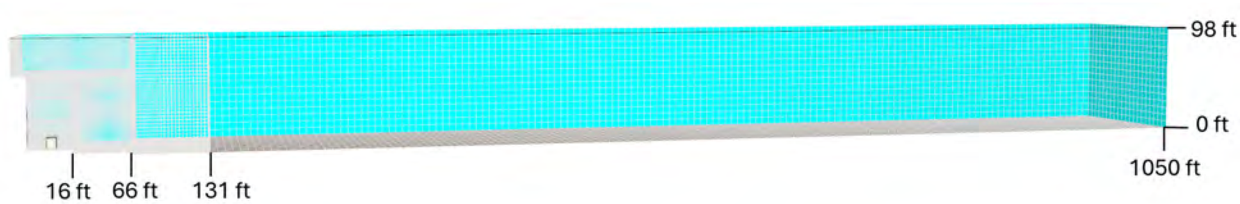


Figure 14: The model with the grid displayed. The grid varies in size from 0.25 m near the unit to 2 m starting 40 m away from the unit. The distances shown are measured from the front of the enclosure.

The EPA Risk Management Program recommends using a wind speed of 1.5 m/s (3.4 mph) and atmospheric stability class F conditions (stable atmosphere) for worst-case plume analysis for accidental chemical releases [13]. This wind speed was used in the model as well as the 99th percentile wind speed for the Long Hill BESS site, which is roughly 8 m/s or 18 mph. Winds at or above this speed may act to partially overcome the upward tendency of a fire plume. The results presented here approximate worst-case results based on the wind speeds modeled and using stable atmospheric conditions with an Obukhov length of 350 meters. Because the Long Hill BESS site is in an area with fields, trees, and scattered buildings, a closed Davenport-Wieringa roughness length of 0.5 m was used.

The wind speeds used in the models are intended to be worst-case. Therefore, results from other wind speeds are expected to be bounded by the wind speeds used. Likewise, modeling a stable atmosphere, in which released gases would tend to stay near ground-level, is considered worst-case. Stable conditions may include fog, because the stability prevents vertical movement of the moist air near the ground. The moisture in fog conditions is not expected to make a plume resulting from battery vent gas release or a fire any worse. Rain during a BESS failure incident is expected to result in a less severe plume than modeled because the falling water could encourage mixing and dispersion over a wider area.

6.2 Results

Model results were collected for battery vent gas concentrations (non-fire scenario) and combustion product concentrations (fire scenarios). The gas concentration of interest was the concentration at 2 m (6.6 ft) above ground level. This corresponds to the concentration that people would experience when standing on level ground near an incident. Figure 15 shows the average vent gas and combustion product gas concentrations at 2 m (6.6 ft) above ground level at different distances downwind of the unit. Figure 15 shows that these concentrations stay low for the non-fire scenario and for the fire scenarios with low wind. For the high-wind fire scenarios, overall combustion product concentrations may be high near the BESS enclosures but drop quickly away from the enclosures. The modeled high wind speed was 8 m/s (18 mph), which is the 99th percentile wind speed for the Long Hill BESS site. However, since toxic gases are only a fraction of the total battery vent gas or combustion products, toxic gas concentrations would be a fraction of these values. As the battery vent gas has a lower flammability limit (LFL) of 7.7% by volume (77000 ppm), the concentration of battery gas does not achieve a flammable condition beyond 2 m (6.6 ft) of the BESS unit.

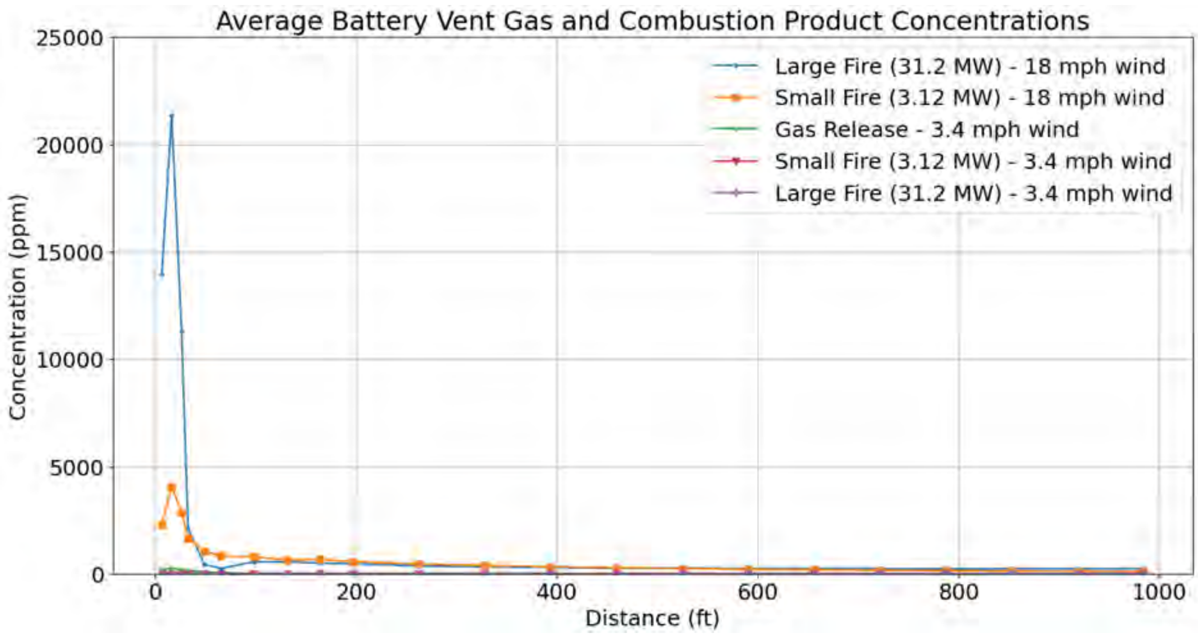


Figure 15: The average battery vent gas or combustion products concentration 2 m (6.6 ft) above ground level versus the downwind distance for different model scenarios.

Battery gas concentrations were very small away from the battery enclosure for the non-fire scenario, as shown in Figure 16.

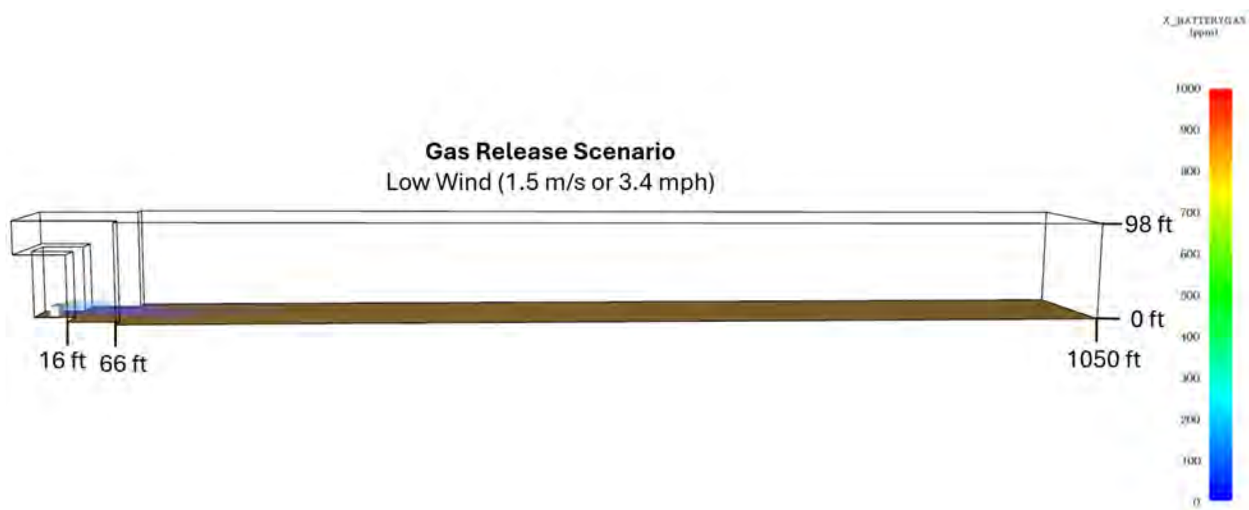


Figure 16: The model for a non-fire scenario with low wind speeds. X_BATTERYGAS is the concentration of battery vent gas in ppm. The distances shown are measured from the front of the enclosure.

The fire scenarios with greater wind speeds resulted in higher concentrations of combustion products 2 m (6.6 ft) above ground level. The heat from fire conditions makes gases more buoyant such that they rise away from the ground. In most common wind conditions, fire product concentrations are low at ground level. However, under conditions of high wind, this buoyant effect may be partially overcome. The scenarios with both fire and high winds yielded the highest gas concentrations near ground level at the greatest distances. Figure 17 shows the model with a full unit fire at high wind speeds. This figure shows that the hot combustion products do not rise immediately due to high wind conditions, but they do rise gradually. Additionally, mixing occurs as the combustion products move away from the enclosure. In contrast, Figure 18 shows that the combustion products rise immediately under low wind conditions.

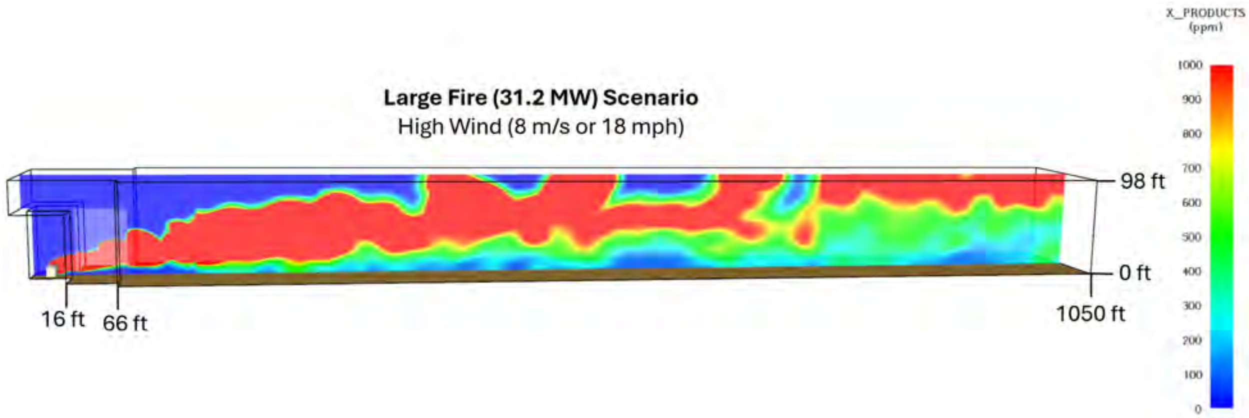


Figure 17: The model of a full unit fire with high wind conditions. In this scenario, the combustion products do not rise immediately due to high wind conditions, but they do rise over time while also mixing with air. X_PRODUCTS is the concentration of combustion products in ppm. The distances shown are measured from the front of the enclosure.

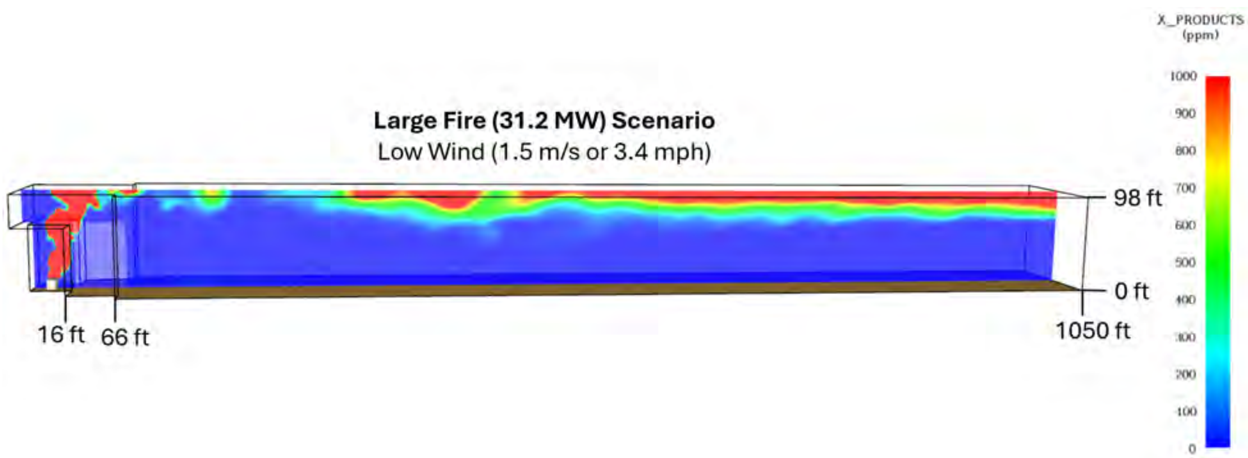


Figure 18: The model of a full unit fire with low wind conditions. In this scenario, the combustion products rise immediately and stay elevated for long distances. X_PRODUCTS is the concentration of combustion products in ppm. The distances shown are measured from the front of the enclosure.

Figure 19 shows that for a smaller fire with high winds, the combustion products stay near ground level for some distance before mixing occurs. Consequently, the combustion product concentration at 2 m (6.6 ft) from ground level may be greater under high wind conditions for the small fire at some distances even though the overall combustion product concentration is greater for the large fire. In low wind conditions, combustion products for a small fire also rise but to a lesser degree than for a large fire scenario as shown in Figure 20.

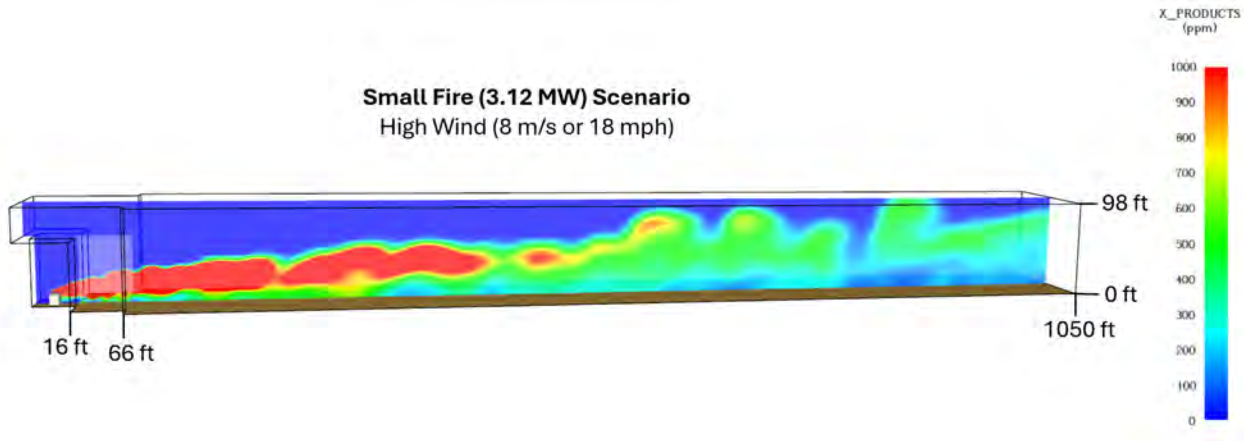


Figure 19: The model of a small fire with high wind conditions. In this scenario, the buoyant effects of the hot gas are partially overcome by the high wind such that the combustion products stay near ground level until mixing occurs. X_PRODUCTS is the concentration of combustion products in ppm. The distances shown are measured from the front of the enclosure.

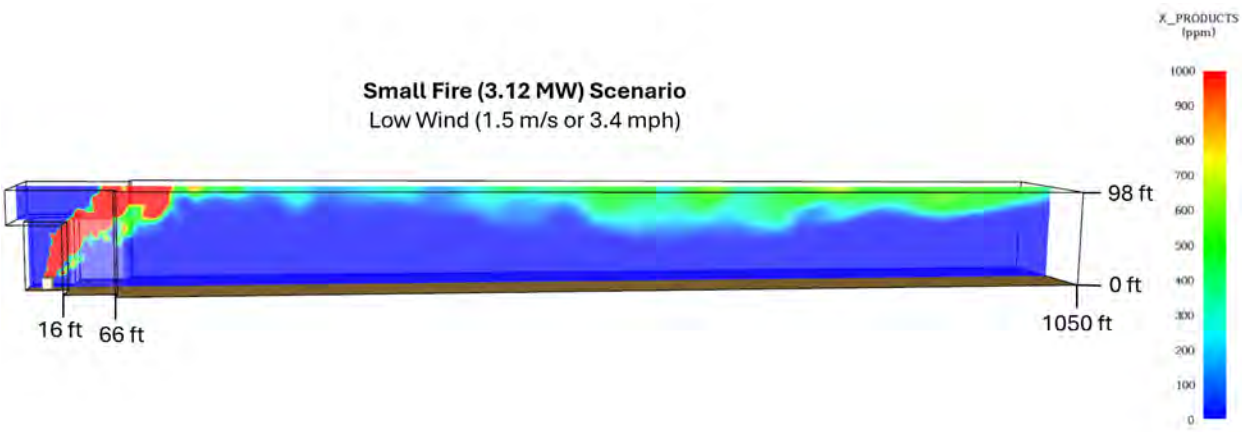


Figure 20: The model of a small fire with low wind conditions. In this scenario, combustion products rise to a lesser degree than in the large fire scenario. X_PRODUCTS is the concentration of combustion products in ppm. The distances shown are measured from the front of the enclosure.

Although multiple toxic gases may be components of battery vent gas, carbon monoxide (CO) is generally the most abundant toxic gas of concern that is regularly reported as part of UL 9540A testing. The UL 9540A cell test report for the Powin Pod listed the carbon monoxide concentration as being 10.095%. This value was used to quantify the amount of carbon monoxide in the non-fire scenario. However, it is unclear what concentration of carbon monoxide may persist through a fire. Carbon monoxide concentration in burned gas is likely to be much lower than in the battery gas as CO is flammable. Carbon monoxide due to incomplete combustion from the fire can also vary depending on the burning environment. Consequently, Hazard Dynamics estimated what amount of carbon monoxide might be present during a fire event using knowledge from work with many battery systems. The CO production was assumed to be 2% of the combustion products. This estimation was based on the measured combustion product concentration from the FDS models. The average carbon monoxide concentration over the 300 m

(984 ft) model domain for both the gas release and fire scenarios is shown in Figure 21. The IDLH (Immediately Dangerous to Life and Health) level for carbon monoxide is 1200 ppm, the AEGL-3 (life-threatening health effects) level for a 30-minute exposure is 600 ppm, and the AEGL-2 (serious health effects) level for a 30-minute exposure is 150 ppm. The EPA does not provide an AEGL-1 (temporary irritation) concentration for carbon monoxide. Model results show that the carbon monoxide concentration is not immediately dangerous to life and health (above the IDLH level) and does not cause life-threatening effects (exceed the AEGL-3 level) at any distance from the enclosure. However, carbon monoxide concentrations may cause serious health effects (exceed the AEGL-2 level) up to approximately 29 ft (8.8 m) from the burning enclosure.

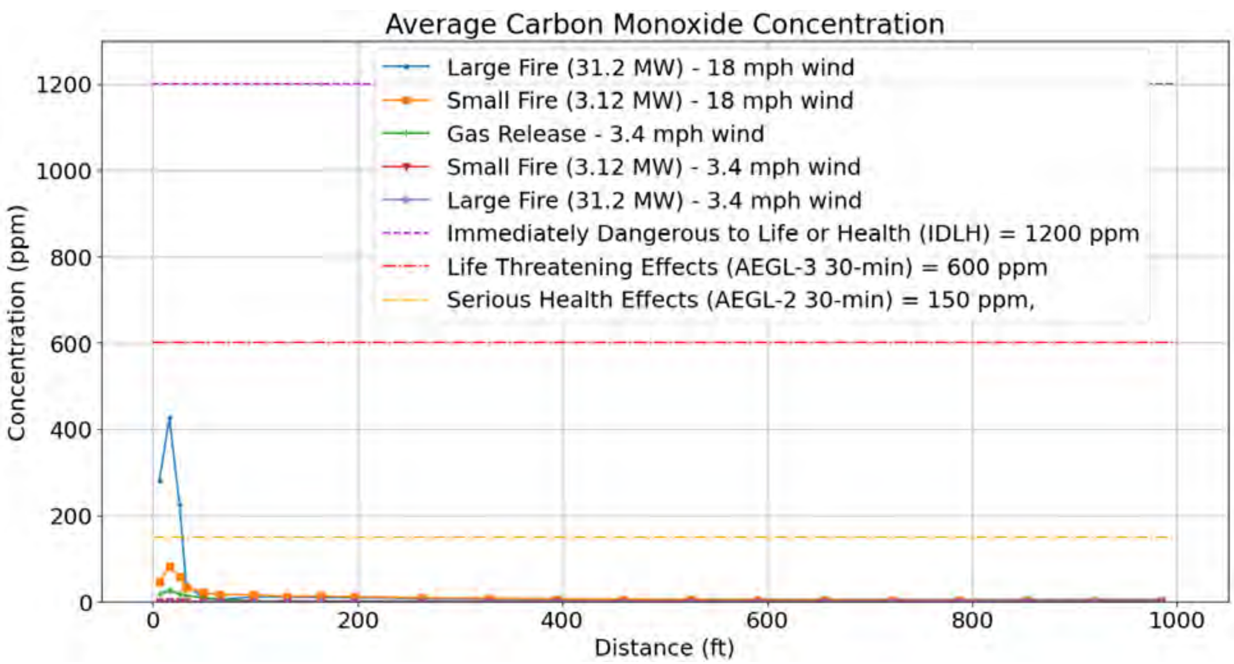


Figure 21: Average carbon monoxide concentrations as a function of distance for different battery vent gas or combustion product release scenarios. From this chart, we see that the carbon monoxide concentration is not immediately dangerous to life and health (above the IDLH level) and does not cause life-threatening effects (exceed the AEGL-3 level) at any distance from the enclosure. However, carbon monoxide concentrations may cause serious health effects (exceed the AEGL-2 level) up to approximately 29 ft (8.8 m) from the burning enclosure in a large fire scenario with high winds. The modeled high wind speed was 8 m/s (18 mph), which is the 99th percentile wind speed for the Long Hill BESS site.

Typically, hydrocarbons such as benzene and toluene are the only toxic gas concentrations other than carbon monoxide that are measured as part of the UL 9540A testing process. These do not present significant toxicity hazards compared to carbon monoxide, as their concentrations in battery gas are usually orders of magnitude less while having generally higher AEGL concentrations than CO. For the REPT BATTERO Energy Co., Ltd. cells, the benzene and toluene concentrations were not reported. Hydrogen fluoride data was also not provided for the Powin Pod system.

7 Conclusion

Of the measured toxic gas species for which test data is available, carbon monoxide is of primary concern due to its comparatively high concentrations and toxicity. Carbon monoxide has an IDLH (immediately dangerous to life and health) level of 1200 ppm, an AEGL-3 (life-threatening health effects) level for a 30-minute exposure of 600 ppm, and an AEGL-2 (serious health effects) level for a 30-minute exposure of 150 ppm. No AEGL-1 level is provided for CO. Carbon monoxide may constitute up to 10.095% of the unburned battery vent gas based upon the provided UL 9540A test report. Carbon monoxide concentrations 2 m (6.6 ft) from ground level were measured by FDS for the non-fire scenario and calculated using modeled fire product concentrations and typical carbon monoxide levels present during lithium-ion battery fires for the fire scenarios. The modeled average carbon monoxide concentration is not immediately dangerous to life and health (above the IDLH level) and does not cause life-threatening effects (exceed the AEGL-3 level) at any distance from the enclosure. However, carbon monoxide concentrations may cause serious health effects (exceed the AEGL-2 level) up to approximately 29 ft (8.8 m) from the burning enclosure in a large fire scenario with high winds. The modeled high wind speed was 8 m/s (18 mph), which is the 99th percentile wind speed for the Long Hill BESS site. No toxicity consequences were present for the modeled scenarios with low wind conditions. Hydrogen fluoride was not measured during the UL 9540A testing for this system. Other measured toxic gases make up only trace amounts of the battery vent gas. Hydrocarbon release quantities are too small to exceed IDLH or AEGL levels at any distance from the unit.

Provided planning documents [1] and publicly available maps indicate that the Long Hill BESS is largely surrounded by fields, forested areas, and ponds. However, there are also populated areas nearby. Approximately 150 houses are located within a half-mile of the Long Hill BESS site, the nearest being about 357 ft away. Schools, offices, and industrial facilities are within roughly a mile of the site (see Figure 2). Based on the model results and the prevailing wind direction at the site (from the northwest and south), it is unlikely that levels of carbon monoxide above the AEGL-2 level will reach populated areas in the event of a single BESS unit experiencing a failure event.

Given the potential risk of toxicity hazards during failure scenarios of the ESS, appropriate emergency response protocols should be considered and developed in collaboration with local emergency personnel. During an incident, site conditions may change and should be monitored throughout the incident. Changes in conditions may require appropriate adjustment to response measures. Additional discussion of emergency response protocols may be provided in a separate emergency response guideline document. Figure 22 shows the areas that could have toxic carbon monoxide gas concentrations exceeding the AEGL-2 level (serious health effects) based on the worst-case modeled scenarios for high winds at the Long Hill BESS project site. This distance was measured from the outermost BESS enclosures. Carbon monoxide concentrations are not expected to exceed IDLH or AEGL-3 at any distance from the BESS enclosures. Note that this figure does not consider possible hydrogen fluoride concentrations.

Maximum Distances for Toxicity Consequences with 99th Percentile 18 mph High Wind

Figure 22: Satellite imagery of the immediate site surroundings with an overlaid area containing possible AEGL-2 levels of toxic gases with steady 8 m/s (18 mph) wind, which is the 99th percentile wind speed for the Long Hill BESS site. No toxicity consequences were present for the modeled scenarios with low wind conditions. Note that these buffers do not account for possible hydrogen fluoride concentrations. This image was produced using Open Street Map and Google Maps.

The buffer in Figure 22 shows the maximum modeled distances for critical concentrations in all possible wind conditions. In reality, the wind will only come from one direction at a time, so a plume resulting from BESS failure will travel predominantly in one direction. Figure 23 shows a modeled plume for a high wind coming from the south, which is one of the prevailing wind directions for the Long Hill BESS site.

Figure 23: Satellite imagery of the immediate site surroundings with an overlaid plume that was modeled with 18 mph wind from the south. Note that this plume does not consider possible hydrogen fluoride levels. This image was produced using Open Street Map and Google Maps.

The analysis in this report assumes that only one battery unit fails or burns at a time and that gas release scenarios are consistent with UL 9540A testing. There are several conditions that may lead to worse consequences than those predicted by this model. Thermal runaway propagation exceeding the measured release rate, involvement of multiple units, and an inversion atmospheric condition–where the air near the ground is cooler than the air above it–can act to trap plumes and pollutants near ground level and could lead to worse consequences.

8 Limitations

- The study presented in this report is intended for use by client to assist with their decision making related to toxicity risks due to plume transport and evolution from Lithium-ion Battery Energy Storage Systems (BESS). This study specifically does not address other energy storage designs, feasibility of other toxic gas mitigation methods, or compliance to local codes and standards. The scope of the analysis was strictly limited to collection of data relevant to scope.
- The scope of services performed may not adequately address the needs of other users of this report, and any re-use of this report is at the sole risk of the user. This study is

based on observations and information available at the time of the analysis. No guarantee or warranty as to future life or performance of any reviewed condition is expressed or implied.

- In the analysis, we have relied on documentation, including but not limited to facility design, BESS design, and other siting documents provided by the client. We cannot verify the correctness of this data and rely on the client for their accuracy. Although we have exercised usual and customary care in the conduct of this analysis, the responsibility for the design and manufacture of the product remains fully with the client.
- The methodology forming the basis of the results presented in this report is based on mathematical modeling of physical systems and data from third parties. Given the nature of these evaluations, significant uncertainties are associated with the various computations. These uncertainties are inherent in the methodology and subsequently in the generated results. Furthermore, the assumptions adopted do not constitute the exclusive set of reasonable assumptions, and use of a different set of assumptions or methodology could produce materially different results.

References

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A Appendix

1.1 Gas Release Rate

Module propagation time

$$t_{modulepropagation} = 783.00000 \text{ second}$$

The amount of gas released by a cell in the cell-level test

$$V_{gascell} = 0.18800 \text{ meter}^3$$

Cells failed in module test

$$n_{cells} = 3$$

Average module release rate

$$r_{gasrelease} = V_{gascell} \cdot \frac{n_{cells}}{t_{modulepropagation}} = 0.18800 \text{ meter}^3 \cdot \frac{3}{783.00000 \text{ second}} = 0.00072 \frac{\text{meter}^3}{\text{second}}$$

Density of the battery gas

$$\rho_{gas} = 0.76902 \frac{\text{kilogram}}{\text{meter}^3}$$

$$G = r_{gasrelease} \cdot \rho_{gas} = 0.00072 \frac{\text{meter}^3}{\text{second}} \cdot 0.76902 \frac{\text{kilogram}}{\text{meter}^3} = 0.00055 \frac{\text{kilogram}}{\text{second}}$$

$0.0005539313817407995 \frac{\text{kilogram}}{\text{second}}$

B Revisions

Table 5: Document revision history.

Revision	Date	Description
0.1	March 25 2025	Initial draft version submitted to client for review.
1.0	May 9 2025	Final addressing client comments

ATTACHMENT D

ENVIRONMENTAL NOTES

Public Water Supply Watershed Protection Program

The western side of proposed Facility is partially located within the Middletown Water Department's public water supply watershed ("PWS" ID CT0830011) that is associated with the nearby Laurel Brook Reservoir, located ±1,900 feet to the southwest. Although the Facility will be constructed to drain to the east away from the public water supply watershed boundary, the following protective measures shall be followed to help avoid degradation of water quality that could potentially affect this public water supply source.

These protective measures satisfy the Connecticut Department of Health's *General Construction Best Management Practices for Sites within a Public Drinking Water Supply Area* (July 2014).

It is of the utmost importance that the Contractor complies with the requirement for the installation of protective measures and the education of its employees and subcontractors performing work on the project site. This protection program shall be implemented regardless of time of year the construction activities occur. All-Points Technology Corporation, P.C. ("APT") will serve as the Environmental Monitor for this project to ensure that these protection measures are implemented properly. The Contractor shall contact Dean Gustafson, Senior Environmental Scientist at APT and The Middletown Water Department personnel, at least five (5) business days prior to the pre-construction meeting. Mr. Gustafson can be reached by phone at (860) 552-2033 or via email at dgustafson@allpointstech.com. The Middletown Water Department can be reached by phone at (860) 638-3500.

The Middletown Water Department will be contacted at least 5 business days prior to the pre-construction meeting with an invitation to attend. The Middletown Water Department personnel will also be allowed to periodically inspect this project during construction to ensure that public water supply resources are being adequately protected.

The public water supply watershed protection program consists of several components: use of appropriate erosion control measures to control and contain erosion; periodic inspection and maintenance of isolation structures and erosion control measures; education of all contractors and sub-contractors prior to initiation of work on the site on the environmentally sensitive nature of the project; protective measures; and, reporting.

1. **Contractor Education**

    a. Prior to work on site, the Contractor shall attend an educational session at the pre-construction meeting with APT. This orientation and educational session will consist of an introductory meeting with APT to understand the environmentally sensitive nature of the development site and the need to follow the public water supply watershed protection measures.

    b. The Middletown Water Department will be contacted a minimum of 5 business days prior to the pre-construction meeting with an invitation to attend.

c. The Contractor will be provided with cell phone and email contacts for Middletown Water Department personnel to immediately report any releases of sediment, fuel or hazardous materials.

d. The Contractor will be provided with cell phone and email contacts for APT personnel to immediately report any releases from the project during construction.

e. APT will also post Caution Signs throughout the project site for the duration of the construction project providing notice of the environmentally sensitive nature of the work area.

2. Erosion and Sedimentation Controls

a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds and small mammals. No permanent erosion control products or reinforced silt fence will be used on the project. Temporary Erosion control products will use either erosion control blankets and fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (net less) or netting composed of planar woven natural biodegradable fiber to avoid/minimize wildlife entanglement.

b. Installation of erosion control measures (i.e., conventional silt fencing, straw bales, straw wattles, compost filter socks, etc.) shall be performed by the Contractor prior to any earthwork. APT will inspect the work zone following erosion control installation to ensure erosion controls are properly installed prior to the start of earthwork.

c. The Contractor is responsible for daily inspections of the sedimentation and erosion controls for tears or breeches and accumulation levels of sediment, particularly following storm events that generate a discharge, as defined by and in accordance with applicable local, state and federal regulations. The Contractor shall notify the APT Environmental Monitor within 24 hours of any breeches of the sedimentation and erosion controls and any sediment releases beyond the perimeter controls. The APT Environmental Monitor will provide periodic inspections of the sedimentation and erosion controls throughout the duration of construction activities only as it pertains to their function to protect the town-designated aquifer protection zone. Such inspections will generally occur once per month. The frequency of monitoring may increase depending upon site conditions, level of construction activities in proximity to sensitive receptors, or at the request of regulatory agencies. If the Environmental Monitor is notified by the Contractor of a sediment release, an inspection will be scheduled specifically to investigate and evaluate possible impacts to resources.

d. Third party monitoring of sedimentation and erosion controls will be performed by other parties, as necessary, under applicable local, state and/or federal regulations and permit conditions.

e. All erosion controls materials and installation/maintenance methods shall follow the *2024 Connecticut Guidelines for Soil Erosion and Sediment Control*. The Contractor is responsible for daily inspections of erosion control measures for tears or breeches in the fabric/material and accumulation levels of sediment, particularly following storm events that generate a discharge. APT will provide periodic inspections of the erosion control measures throughout the duration of construction activities.

f. The extent of the erosion control will be as shown on the site plans. The Contractor shall have additional erosion control materials stockpiled on site should field conditions warrant extending/reinforcing erosion control as directed by APT or other responsible agencies.

g. All silt fencing and other erosion control devices shall be removed within 30 days of completion of work and permanent stabilization of site soils. If fiber rolls/wattles, straw bales, or other natural material erosion control products are used, such devices will not be left in place to biodegrade and shall be promptly removed after soils are stable. Seed from seeding of soils should not spread over fiber rolls/wattles as it makes them harder to remove once soils are stabilized by vegetation.

3. Petroleum Materials Storage and Spill Prevention and Response

a. The Contractor shall designate an individual who is responsible for emergency response coordination and available on a 24/7 basis. That responsible individuals contact information shall be provided to the Middletown Water Department and Connecticut Siting Council.

b. Certain precautions are necessary to store petroleum materials, refuel and contain and properly clean up any inadvertent fuel or petroleum (i.e., oil, hydraulic fluid, etc.) spill due to the project's location within the public water supply watershed protection zone.

c. Please refer to the draft Spill Prevention Control and Countermeasure (SPCC) Plan for this project, per the requirements of 40 CFR 112, has been developed for this facility, please refer to the SPCC for specific requirements. Basic requirements for petroleum materials storage and spill prevention are provided below. In the event these basic requirements contradict the SPCC, the Contractor shall rely on requirements provided in the SPCC. A finalized SPCC will be compiled and will be included in the Building Permit Application.

d. A spill containment kit consisting of a sufficient supply of absorbent pads and absorbent material shall be maintained by the Contractor at the construction site throughout the duration of the project. In addition, a waste drum will be kept on site to contain any used absorbent pads/material for proper and timely disposal off site in accordance with applicable local, state and federal laws.

e. Servicing of machinery on site should be completed outside of the public water supply watershed protection zone and over secondary containment measures.

f. At a minimum, the following petroleum and hazardous materials storage and refueling restrictions and spill response procedures shall be adhered to by the Contractor.

   i. Petroleum and Hazardous Materials Storage and Refueling

      1. Refueling of vehicles or machinery shall occur a minimum of 100 feet from wetlands or watercourses and shall take place on an impervious pad with secondary containment designed to contain fuels.

      2. Fuel and other hazardous materials should not be stored within the public water supply watershed protection zone. Any fuel or hazardous materials that must be kept on site outside of the public water supply watershed protection zone shall be stored on an impervious surface utilizing secondary containment that can retain 110% of the total volume a minimum of 100 feet from wetlands or watercourses.

   ii. Initial Spill Response Procedures

      1. Stop operations and shut off equipment.

      2. Remove any sources of spark or flame.

      3. Contain the source of the spill.

      4. Determine the approximate volume of the spill.

      5. Identify the location of natural flow paths to prevent the release of the spill to nearby storm drains.

      6. Ensure that fellow workers are notified of the spill.

   iii. Spill Clean Up & Containment

      1. Obtain spill response materials from the on-site spill response kit. Place absorbent materials directly on the release area.

      2. Limit the spread of the spill by placing absorbent materials around the perimeter of the spill.

      3. Isolate and eliminate the spill source.

      4. Contact The City of Middletown Water Department personnel along with other appropriate local, state and/or federal agencies, as necessary.

5. Contact a disposal company to properly dispose of contaminated materials.

iv. Reporting

1. Complete an incident report.
2. Submit a completed incident report to local, state and federal agencies, as necessary, including the Connecticut Siting Council and Middletown Water Department.

4. Herbicide and Pesticide Limitations

a. The use of herbicides and pesticides at this site shall be avoided when possible.

b. If use of herbicides and pesticides are required at this site, usage should be limited and follow Integrated Pest Management ("IPM") techniques, including focused spot applications and avoidance of broad-spectrum applications of chemicals.

5. Salt Limitations

a. Salt usage should be limited for snow and ice management at this site. ; sand only should be first considered. If salt deicers are required, minimize the application of chloride-based deicer salt with use of more environmentally friendly non-chloride alternatives.

6. Reporting

a. Compliance Monitoring Reports (brief narrative and applicable photos) documenting each APT inspection will be submitted by APT to the Permitee for compliance verification. Any observations of corrective actions will be included in the reports.

b. Following completion of the construction project, APT will provide a final compliance monitoring report to the Permitee documenting implementation of the public water supply resources protection program and monitoring observations. The Permitee shall provide a copy of the final compliance monitoring report to the Middletown Water Department and Connecticut Siting Council for compliance verification.

c. Any significant releases of sediment that could impact water quality shall be reported by the Permitee to the Middletown Water Department and Connecticut Siting Council within 24 hours.

ATTACHMENT E

REMOTE FIELD REVIEW

CT SITING COUNCIL PETITION NO. 1653
RESPONSE TO INTERROGATORY #80
LONG HILL BESS
1825 SOUTH MAIN STREET
MIDDLETOWN, CT

PREPARED FOR:

EAST POINT ENERGY
AN EQUINOR COMPANY

PREPARED BY:
ALL-POINTS TECHNOLOGY CORPORATION, P.C.
567 Vauxhall Street Extension – Suite 311
Waterford, CT 06385

PHOTO LOG

- Photo Locations
- Property
- Approx. Parcel Boundary
- Proposed Easement Area
- Approximate Wetland Boundary
- Approximate Wetland Area
- Utility Pole
- OH Utility Line
- Project Limits of Disturbance
- O&M Building
- Battery Enclosures
- Inverters and Transformers
- Conc. Equipment Pads
- BESS Gravel Pad
- Gravel Access Drive
- Temporary Construction Staging Area
- Stormwater Basin
- Stormwater Level Spreader
- Catch Basin
- 20' High Sound Barrier Wall

N

200 100 0 200 Feet

ALL-POINTS TECHNOLOGY CORPORATION

Proposed Battery Storage Facility
Long Hill Energy Center
1825 South Main Street
Middletown, Connecticut

PHOTOGRAPHED ON 5/7/2025

PHOTO	DESCRIPTION
1	**LONG HILL ROAD LOOKING EAST**

ALL-POINTS TECHNOLOGY CORPORATION

EAST POINT ENERGY AN EQUINOR COMPANY

PHOTOGRAPHED ON 5/7/2025

PHOTO	DESCRIPTION
2	**LONG HILL ROAD LOOKING EAST**

PHOTO	DESCRIPTION
3	**LONG HILL ROAD LOOKING EAST**

ALL-POINTS TECHNOLOGY CORPORATION

EAST POINT ENERGY AN EQUINOR COMPANY

PHOTOGRAPHED ON 5/7/2025

PHOTO	DESCRIPTION
4	**DRONE PHOTOGRAPH**

ALL-POINTS TECHNOLOGY CORPORATION

EAST POINT ENERGY
AN EQUINOR COMPANY

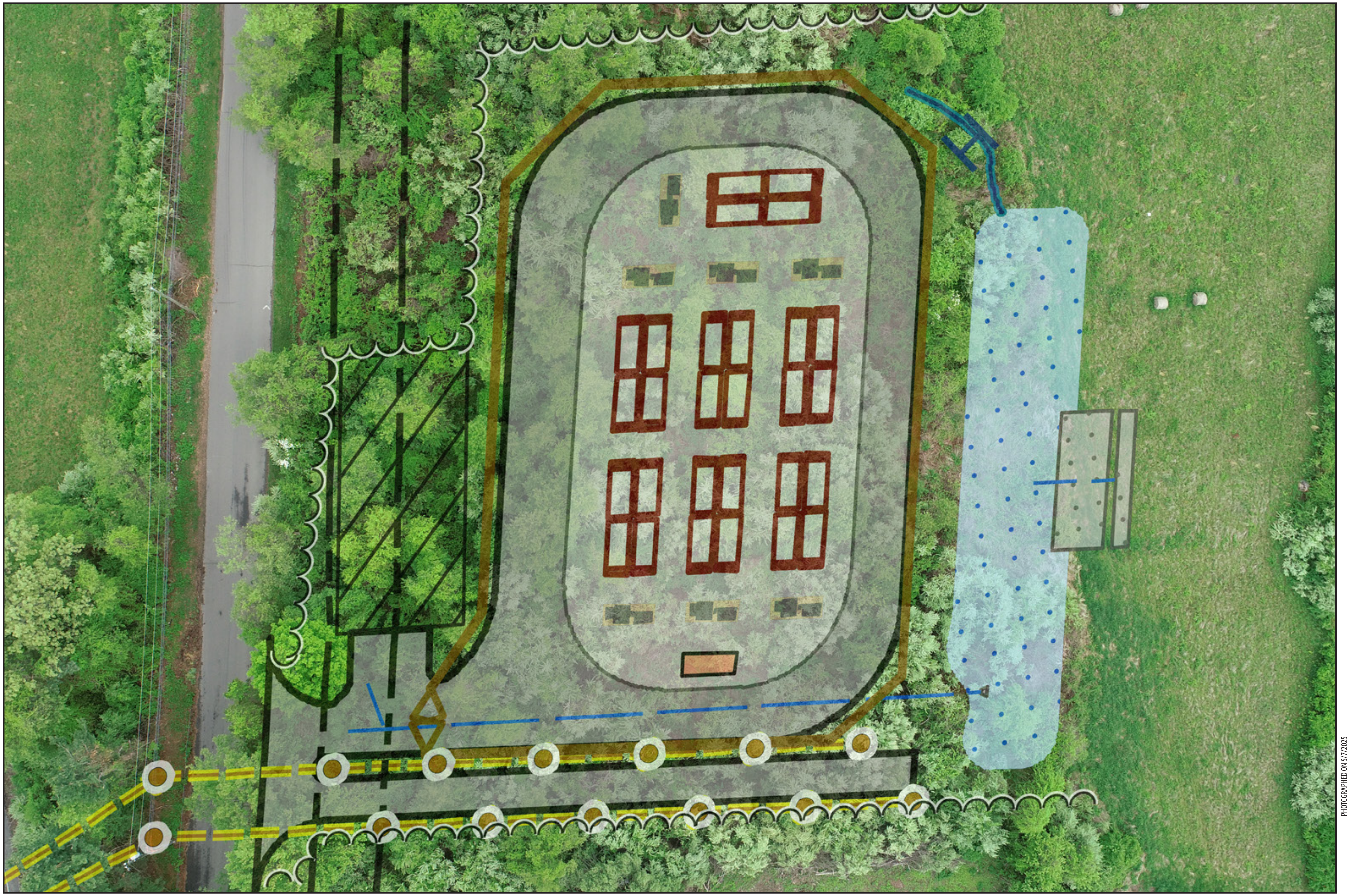

PHOTO	DESCRIPTION
4-A	**DRONE PHOTOGRAPH WITH PROPOSED CONDITIONS OVERLAY**

ALL-POINTS TECHNOLOGY CORPORATION

EAST POINT ENERGY
AN EQUINOR COMPANY