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April 1, 2024

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

Re: Petition No. 1604 – Endurant Energy petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of an 18.0-megawatt AC battery energy storage facility located at 50 Ucar Street (Parcel No. 70H-55-97), Suffield, Connecticut, and associated electrical interconnection.

Dear Ms. Bachman:

Enclosed for filing with the Connecticut Siting Council (“Council”) are Endurant Energy’s responses to the Council’s February 26, 2024 interrogatories.

An original and fifteen (15) copies of this filing will be hand-delivered to the Council today.

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

Very truly yours,



Bruce L. McDermott

Enclosures

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Interrogatory CSC 1

Endurant Energy  
Petition No. 1604

Witness: Brian Mehler  
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Q-CSC 1: Has Endurant Energy (Endurant) received any comments since the Petition was submitted to the Council? If yes, summarize the comments and how these were addressed.

A-CSC 1: No comments have been received.

## Interrogatory CSC 2

Endurant Energy  
Petition No. 1604

Witness: Brian Mehler  
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Q-CSC 2: Referencing Petition page 5, what Energy Storage Solutions Program (ESSP) incentives apply to the project?

A-CSC 2: The project will be eligible for the Passive Dispatch program upfront incentive at the Large Commercial Tier rate. It will also be eligible for the Summer and Winter Performance Incentives under the Active Dispatch program.

### Interrogatory CSC 3

Endurant Energy  
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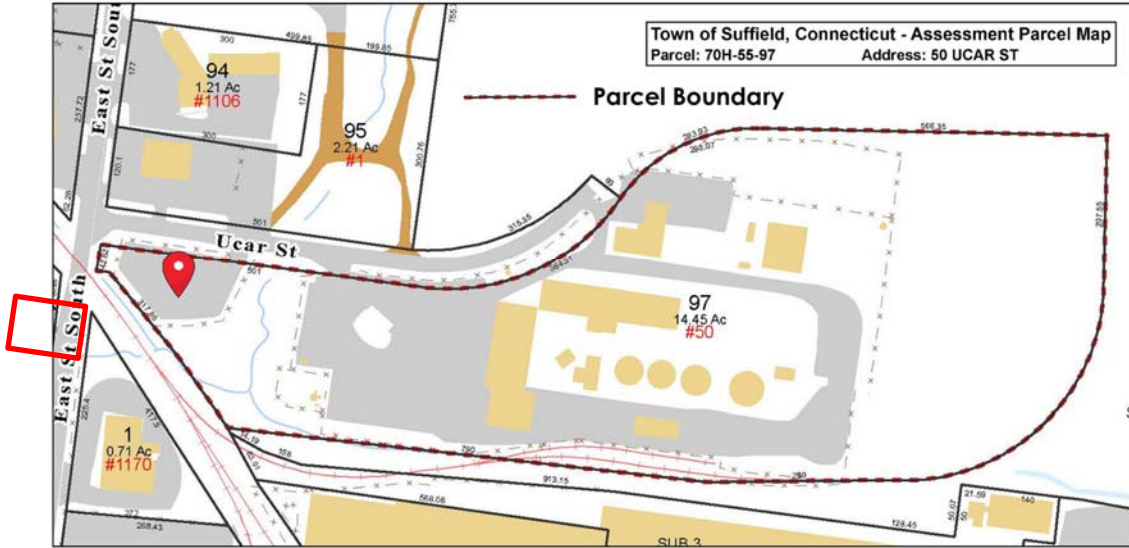
Witness: Brian Mehler  
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- Q-CSC 3: Submit a map clearly depicting the boundaries of the battery energy storage facility (BESF) site and the boundaries of the host parcel(s). Under Regulations of Connecticut State Agencies (RCSA) §16-50j-2a(29), "Site" means a contiguous parcel of property with specified boundaries, including, but not limited to, the leased area, right-of-way, access and easements on which a facility and associated equipment is located, shall be located or is proposed to be located.
- A-CSC 3: The Site is defined as the area of the host parcel that is to be leased by Endurant and is identified by the BESF perimeter fencing. No rights-of-way, access or easements are associated with the proposed Site. The final dimensions may vary slightly from what is shown depending on utility requirements.

Interrogatory CSC 3

Endurant Energy  
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Battery Energy Storage System  
Praxair, Inc.  
1 U Car Street  
Suffield, Connecticut

Figure 4  
Parcel and Site Boundaries

## Interrogatory CSC 4

Endurant Energy  
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Q-CSC 4: What activities/operations occur on the host parcel and what structures are located on the host parcel?

A-CSC 4: The host parcel is home to a gas processing facility run by Linde plc. The facility operates 24-7, producing three cryogenic liquids: nitrogen, oxygen & argon. The site also includes storage for the products created, and office space for administrative and managerial staff. Existing structures are all in the center of the parcel (approximately 450 feet to the east of the proposed BESF). A wooded area of the parcel then extends further to the east. The structures include administrative offices, manufactory space and 4 large storage silos for the cryogenic liquids.

Interrogatory CSC 5

Endurant Energy  
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Q-CSC 5: Has the property owner expressed any concerns or requested any specific requirements related to decommissioning or site restoration at the end of the project's useful life? If so, please describe.

A-CSC 5: No. The property owner has not expressed any concerns or requested any requirements related to decommissioning or site restoration.

Interrogatory CSC 6

Endurant Energy  
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Q-CSC 6: Referencing Petition Figure 3 and Appendix C - Photolog, what is the length and width of the existing access drive to the point where it would reach the BESF?

A-CSC 6: The existing access drive is a minimum of approximately 23 feet wide. It would be approximately 85 feet to the nearest corner of the BESF perimeter fencing from the start of the access drive measured from at the point at which it meets East Street S.



Interrogatory CSC 7

Endurant Energy  
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Q-CSC 7: Provide the distance, direction and address of the nearest residential property line to the proposed facility.

A-CSC 7: The southern edge of the property line of 1059 East Street S, Suffield, CT 06078 is approximately 750 feet to the north of the proposed BESF, on the west side of East Street S.

Interrogatory CSC 8

Endurant Energy  
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Q-CSC 8: Provide the distance, direction and address of the nearest residential structure to the proposed facility.

A-CSC 8: The residential structure at 1059 East Street S, Suffield, CT 06078 is approximately 900 feet to the north of the proposed BESF, on the west side of East Street S.

## Interrogatory CSC 9

Endurant Energy  
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Q-CSC 9: What is the approximate percentage of Praxair, Inc. annual electric load that would be served by the BESF?

A-CSC 9: Because this is an energy storage system and not an energy generation system, when the BESF serves Praxair's facility, it will not 'off-set' a specific portion of the overall load, but instead will 'shift' the load required to lower-priced 'off-peak' times from expensive peak times (when the battery will be discharged). This load shifting, or management, will occur year-round. See the Demand Management graph below. During the summer months, from June 1 through September 31, the battery will be participating in the ESS program. Again, it will charge during off-peak hours, but during the program's Performance Season, it will discharge as requested by the Program Administrators. See the Demand Response graph below.

In terms of approximate percentages, the total annual consumption of the site with the battery is expected to be around 98,000 MWh, and the load that the battery will manage will be 9,000 MWh - approximately 9.2% served.

Interrogatory CSC 10

Endurant Energy  
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Q-CSC 10: How long will it take for the BESF to attain full output from when it is dispatched?

A-CSC 10: Typically the inverter systems can dispatch almost instantaneously (a matter of milliseconds) and the BESF will attain the requested output within 1 cycle (1/60 of a second).

Interrogatory CSC 11

Endurant Energy  
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Q-CSC 11: What is the cumulative efficiency of the discharge output (e.g.- the BESF can only discharge 90% of its stored capacity)?

A-CSC 11: The BESF can discharge to 100% of its stored capacity from a technology perspective. During Passive Dispatch calls from the ESSP there is a requirement to retain 20% of stored capacity, therefore although it can dispatch to 100% of stored capacity, Endurant will not choose to do so every time it discharges.

Interrogatory CSC 12

Endurant Energy  
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Q-CSC 12: What storage capacity losses are anticipated for ambient temperatures below freezing?

A-CSC 12: The battery operates in a range of -30 degrees Celsius (-22 degrees Fahrenheit) up to 55 Celsius (131 Fahrenheit). Power derate happens above 45 Celsius.

Interrogatory CSC 13

Endurant Energy  
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Q-CSC 13: Would the BESF 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?

A-CSC 13: No heating is required, however there is a liquid cooling system to cool the batteries, which is sourced from the local distribution system when there is no energy in the cells. The auxiliary power also powers the fire alarm and BMS. The peak auxiliary power load is 32.7kW.

Interrogatory CSC 14

Endurant Energy  
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- Q-CSC 14: Referencing Petition p. 4, it states the BESF will be connected behind the customer's electric utility meter, which will allow the facility to run on battery power during peak demand time. It further states the BESF will operate in parallel with the grid and can also export power into the utility distribution system, during peak demand times. During peak demand times does the grid or the Praxair Inc. facility utilize the BESF output?
- A-CSC 14: The grid and Praxair's facility will both use the battery's energy during peak times, however the ESSP will have priority where the ESSP calls and Praxair's demand management requirements coincide. In the summer, when the BESF is participating in the ESS Program (June 1 through September 30), upon the ESS Program manager's instructions, the battery will be depleted in 2 to 3 hours. For the remaining 8 months of the year Praxair will have exclusive use of the output for demand management purposes.



Interrogatory CSC 15

Endurant Energy  
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Q-CSC 15: Referencing Petition p.25, does Praxair Inc. operate at full capacity on weekends? If no, would the BESF be dispatched to export excess power to the grid?

A-CSC 15: Praxair manufactures in three shifts, with '24/7' operations. During the summer, the BESF is enrolled in the ESS Program and can be actively dispatched between 12pm and 9pm any day of the week. During times when dispatch has been called for by the program manager it will be discharged to the grid, otherwise the BESF will not be dispatched to export excess power to the grid, only to the maximum of Praxair's energy load.

Interrogatory CSC 16

Endurant Energy  
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Q-CSC 16: Referencing Petition p. 25, assuming favorable energy prices, what is the estimated time it would take the BESS to fully recharge after a full 18 MWh AC discharge?

A-CSC 16: Theoretically, the minimum amount of time it could take for the battery to recharge is 2 hours. In reality, it will depend on Praxair's energy demand and favorable energy pricing periods. Typically charging will occur over several off-peak hours.

Interrogatory CSC 17

Endurant Energy  
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Q-CSC 17: Referencing Petition Figure 3 and pp. 6, 7, 20 and 27, please confirm the total number of transformers that would be installed at the facility?

A-CSC 17: There are 6 transformers proposed for the facility (including 1 auxiliary transformer.)

Interrogatory CSC 18

Endurant Energy  
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Q-CSC 18: Referencing Petition p. 11, what is the status of the interconnection study/agreement with Eversource? Is it anticipated the battery manufacturer/model will change based on the interconnection agreement?

A-CSC 18: Endurant is in the System Impact Study stage. Based on feedback received to date, Endurant does not believe the interconnection agreement will directly impact the battery manufacturer or model. If Endurant is required to change supplier, it will be due to commercial factors, such as the supplier's ability to provide the equipment within reasonable timeframes. If the supplier does change, the interconnection agreement will not be affected, because the inverter and transformer manufacturers will remain the same; it is the invertors and transformers that impact the utility.

Interrogatory CSC 19

Endurant Energy  
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Q-CSC 19: Referencing Petition p. 13-14, what is the length of the proposed underground electrical interconnection?

A-CSC 19: It is approximately 140 feet from the perimeter of the proposed BESF to the existing substation perimeter fence. This is the distance of the trenched underground electrical cable.

Interrogatory CSC 20

Endurant Energy  
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Q-CSC 20: Referring to Petition Appendix G, provide the estimated sound levels from BESF operation at the nearest residential structure.

A-CSC 20: The proposed BESF would not be audible from the nearest residential structure.

Interrogatory CSC 21

Endurant Energy  
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- Q-CSC 21: Referencing Petition Appendix G – Sound 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, and does such scenario also take into account any fans for the cooling system? Explain.
- A-CSC 21: The system will generate sound when charging and discharging and when the air conditioning system is in use. The scenario takes the cooling fans into account. Neutral conditions ('standby mode') do not generate noise. The sound assessment was modelled on the 'worst-case' scenario and examined noise levels from all the equipment of the proposed system, including the batteries, the inverters and the transformers.

## Interrogatory CSC 22

Endurant Energy  
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Q-CSC 22: Provide the design specifications of the proposed fence. Did Endurant consider an anti-climb design?

A-CSC 22: As noted in the petition, Endurant discussed the fence with the Director of Planning and Development, Engineer Liaison for Suffield. As written, the zoning regulations require fencing that can be seen through and that is a maximum height of 4 feet within 50 feet of a public road. Endurant informed him that Endurant would note that it plans for chain link fencing at this site rather than our standard palisade fencing, which is harder to climb, to try to comply with the town's wishes to the best of our ability however Endurant would request 8 feet not 4 feet height. Endurant discussed that the town's regulations are designed 'in spirit' to protect residential areas, rather than meant for commercial or industrial sites like this. There is no code or standard addressing fence height requirement for this application and there is no exposed 'live' electrical equipment, but for public safety Endurant does not wish members of the public to have easy access to the BESF hence our request for a minimum of 8 feet height. Endurant would of course take the Council's recommendation, if its preference was for palisade fencing over chain link.



Interrogatory CSC 23

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Q-CSC 23: Would bollards be used to protect the BESF from being accidentally struck by a vehicle?

A-CSC 23: Bollards will be included within the fenced area to protect the equipment where necessary.

Interrogatory CSC 24

Endurant Energy  
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Q-CSC 24: Is a gap proposed between the bottom of the fence and grade. What animal deterrents are in place for small animals, such as nesting birds, chewing rodents, etc.?

A-CSC 24: No gap is proposed. All equipment and any penetrations are properly sealed to limit intrusive rodent concerns. Endurant's experience is that this is sufficient, however regular visual inspections will confirm.

Interrogatory CSC 25

Endurant Energy  
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Q-CSC 25: What is the distance of the BESF from the Praxair gas processing and supply facilities on the host parcel? Are there required safety setbacks for any land uses from the gas processing and supply facilities? Explain.

A-CSC 25: From the perimeter fencing of the BESF to the nearest gas processing facility structure is approximately 450 feet. Endurant has discussed this with Praxair, and researched CT regulations, and not found anything relevant to this project in relation to processing and supply facilities. Endurant will be working with the site owner, local contractors, local AHJs, and engineering SMEs to ensure that any prudent measures are included in the design.

## Interrogatory CSC 26

Endurant Energy  
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Q-CSC 26: Referencing Petition p. 30 a battery fire would be allowed to self-extinguish. What is the typical duration of a battery fire before it self-extinguishes? If one battery caught fire, can it easily spread to adjacent batteries? Explain.

A-CSC 26: BESS fires can take several hours to burn themselves out. Each battery system completes UL 9540A testing which is a destructive test method used for evaluating the thermal runaway impacts in a BESS and gathering data to assist in assessing or developing mitigation plans. Endurant would only consider deploying systems which have demonstrated no module-to-module propagation. The BYD Cube Pro is made up of 24 battery packs in 8 racks with 3 packs per rack, and with 114 cells per pack. The 9540A testing showed only 5 cells damaged during the test confirming the design limited propagation within the module and will not propagate through the entire BESS nor adjacent BESS. The test indicated no external flames or explosive gas levels were detected.

Interrogatory CSC 27

Endurant Energy  
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Q-CSC 27: Referencing Petition p. 27, when and what type of testing would be conducted on the BESF exhaust fan/sensors, and smoke, thermal and gas detectors prior to installation at the site?

A-CSC 27: The battery systems come with on-board sensors and detectors that meet UL, NERC, and NFPA standards. The exact make and model of sensors will depend on the final system design and equipment suppliers selected. The detectors will have communications and alert protocols to communicate instantaneously with battery system control rooms, on-site facilities, and the local fire department.

Interrogatory CSC 28

Endurant Energy  
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- Q-CSC 28: Referencing Petition Appendix A, a lithium-ion phosphate safety data sheet is provided. Section 5 of the sheet states “battery may burst and release hazardous decomposition products when exposed to a fire situation.” If a battery burst,
- a. would smoke from the fire be considered hazardous and require notification to local authorities?
  - b. would smoke require area residences to stay in place or evacuate? If yes, who would determine if these actions are necessary?
- A-CSC 28:
- a. Smoke from a potential fire could be hazardous, but would depend on the type of fire and what equipment is impacted. It is in our EMP and design-build process to work with and hold formal training sessions with fire department personnel prior to commercial operation so that fire response scenarios are planned for, mapped, and standardized ahead of time.
  - b. There are no residences within the immediate vicinity of the proposed BESF. Endurant does not envisage that any residences would be required to evacuate, however the Suffield Fire Department would determine what actions they deemed to be appropriate, and Endurant would provide any support requested of them by the Fire Department.

Interrogatory CSC 29

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Q-CSC 29: Would Endurant dispatch personnel to the BESF in the event of a fire? Where would Endurant personnel be located that can respond to site emergencies?

A-CSC 29: The BESF is remotely staffed, except for semi-annual routine maintenance activities when contractors are on-site however it is continuously remotely monitored by a Remote System Operator via a proprietary system called Enerwise, which is built and operated by CPower, Endurant's associate company with whom Praxair have a pre-existing contractual relationship for demand response services. In the event of a fire, an Endurant employee would be available 24/7 by telephone and would consult with responders to provide system information useful in event characterization and response planning. A member of Endurant's team would be dispatched to the location as soon as possible (at most 24 hours).

On-site members of the property owner's team (Praxair employees) will be designated as the BESF contact/liaison and will be trained on the BESF and in emergency response protocols related to the facility. The designated liaison would respond immediately to the event, and provide information and facilitate communication with Endurant staff. During an emergency response event, staff personnel and emergency responders are automatically contacted. The communications plan will be reviewed and approved by the Suffield Fire Department, and training on its implementation will be conducted with Suffield Fire Department and Praxair staff, after installation and prior to operation. See Petition Appendix J for further detail on Emergency Planning and Communications.

Interrogatory CSC 30

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Q-CSC 30: Petition p. 30 states explosion risk would be minimized by exhaust fans/sensors. Are these features susceptible to fire and subject to failure? Are they within a fire enclosure?

A-CSC 30: Upon heat or smoke detection the fans will activate and vents will open allowing the system container to vent well before any fire may propagate through the BESF to cause damage. If both redundant fans were to fail, the pressure balancer would be activated to further mitigate explosion risk. The pressure balancer balances pressure when pressure difference occurs in the container. Pressure difference would arise due to insufficient air flow.



Interrogatory CSC 31

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Q-CSC 31: What explosion mitigation system is more effective, vent panels or an exhaust system? Explain.

A-CSC 31: NFPA 855 requires one of two methods of explosion control; the first is deflagration management with the use of explosion panels which will direct the impact of explosion to minimize damage; the second is the use of active ventilation to prevent the buildup of explosive or flammable gases to reduce the risk of explosion. The latter, active ventilation, is preferred due to its proactive nature. In the event of the failure of both redundant exhaust fans, the systems are equipped with a passive pressure balancer which will activate if unvented air builds up pressure to allow air/gases to vent.

Interrogatory CSC 32

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Q-CSC 32: Referencing Petition Appendix E, the air-cooling refrigerant safety data sheet states refrigerant could be explosive under certain conditions. Would a battery fire or other fire at the site potentially cause the refrigerant to explode?

A-CSC 32: The refrigerant becomes combustible at over 1,400 degrees F. The battery system under fire will not reach that temperature.

Interrogatory CSC 33

Endurant Energy  
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Q-CSC 33: What is the distance from the limit of disturbance to the nearest wetland boundary?

A-CSC 33: The site sits to the south and east of wetland areas, the former on the opposite side of Ucar St, and the latter on the opposite side of East Street South. It is approximately 200 feet from the limit of the disturbance to the wetland boundary of both.

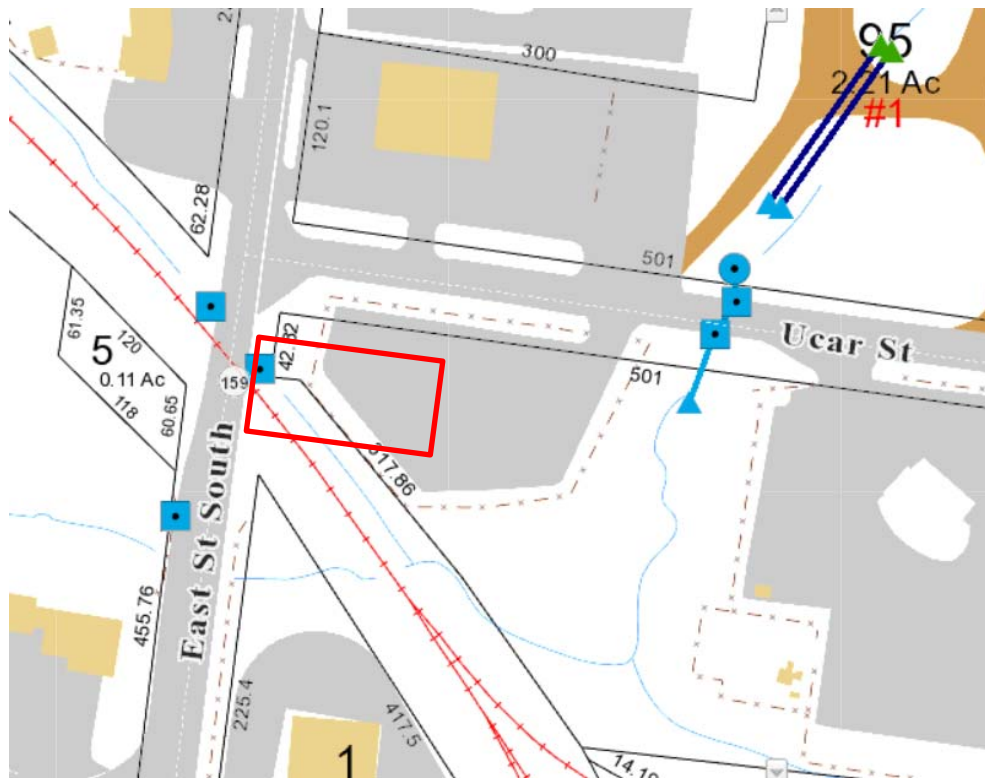
## Interrogatory CSC 34

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Q-CSC 34: Have drainage characteristics of the proposed site been evaluated to ensure water will not pool around the BESF? Where would stormwater be directed?

A-CSC 34: The site is on an existing levelled paved parking lot. A preliminary survey was undertaken to confirm no critical issues. Stormwater would be directed to existing storm drainage system infrastructure (please refer to image below) anticipated to be to the east of the site. This will be determined during the pre-detailed engineering survey process.



Interrogatory CSC 35

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Q-CSC 35: Are there any wells on the site or in the vicinity of the site? If so, how would Endurant protect the wells and/or water quality from potential construction, operation and/or emergency response impacts?

A-CSC 35: There are no wells on the site.

Interrogatory CSC 36

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Q-CSC 36: Did Endurant consider installing any landscaping around the perimeter of the fence to reduce visibility within the immediate surrounding area?

A-CSC 36: Given the industrial nature of the property, and fact that the site would be located on an already paved parking lot, Endurant has not considered landscaping around the perimeter of the fence.

## Interrogatory CSC 37

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Q-CSC 37: 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.

Interrogatory CSC 37

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A-CSC 37: The below photos provide additional views of the area of the project.





Interrogatory CSC 38

Endurant Energy  
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Q-CSC 38: Referring to Petition p. 17, would any excess cut and fill material be removed from the site or deposited on the site?

A-CSC 38: Endurant expects to excavate up to 1,200 cubic yards of earth. Most of it will be removed off-site to avoid inconveniencing Praxair, and taken to an appropriate facility based upon the soil composition tests. Endurant will perform soil borings to assess the conditions of the soil and ensure proper treatment and disposal plans and notifications are made based upon the results of the tests.

Interrogatory CSC 39

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Q-CSC 39: Provide detailed site plans with notes/plans for site construction and environmental mitigation.

A-CSC 39: The final site and construction plans are not yet finalized for this project because it is still too early in the utility interconnection process. Endurant will issue copies of those documents to the CSC, and to other pertinent stakeholders, once those are complete. Environmental mitigation measures to be taken during site clearing and construction will include the use of silt fencing to control erosion and runoff during precipitation events, water spray to reduce dust, minimizing the clearing necessary for the project, and standardizing operating times to minimize sound and light impacts outside of normal business hours. Construction will be coordinated with Praxair personnel to ensure continued access to the Praxair facility by emergency responders and other critical traffic during the construction phase.

Interrogatory CSC 40

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Q-CSC 40: Referencing Petition p. 7, what is the area, in square feet, of the paved portion of the development area?

A-CSC 40: All of the development area is currently paved. Endurant anticipates the total BESF site will be approximately 16,000 square feet.

Interrogatory CSC 41

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Q-CSC 41: When does Endurant anticipate an Operations and Maintenance Plan for the proposed facility will be available?

A-CSC 41: An Operations and Maintenance Plan will be available post completion of final detailed engineering, but before Commercial Operations Date.

Interrogatory CSC 42

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Q-CSC 42: Referencing Petition pp. 13 and 26, please provide the following information:

- a. What is the anticipated annual degradation of battery storage capacity?
- b. At what remaining battery capacity is replenishment recommended?
- c. What is the estimated cost of replenishment?

A-CSC 42: a. Please refer to the annual degradation table for the proposed batteries (note that this table is purely at the battery container level and does not include losses of energy throughput in the balance of plant equipment).

*BYD Degradation Curve*

<i>Start of Year</i>	<b>365 cycles per year</b>	
<b>Year</b>	<b>Minimum energy retention</b>	<b>Annual reduction</b>
1	100.0%	
2	93.8%	6%
3	91.1%	3%
4	89.0%	2%
5	87.2%	2%
6	85.6%	2%
7	84.1%	1%
8	82.7%	1%
9	81.5%	1%
10	80.3%	1%
11	79.1%	1%

- b. This is not applicable, because the business model does not involve replenishment. The only circumstances under which replenishment would take place would be under manufacturer's warranty, due to a failure of the battery to meet required performance targets.
- c. This is not applicable, because the business model does not involve replenishment. The only circumstances under which replenishment would take place would be under manufacturer's warranty, due to a failure of the battery to meet required performance targets.

Interrogatory CSC 43

Endurant Energy  
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Q-CSC 43: What minimum snow depth would require removal within the BESF compound??

A-CSC 43: No snow removal is required, regardless of depth.