

What Powers You

September 12th, 2023

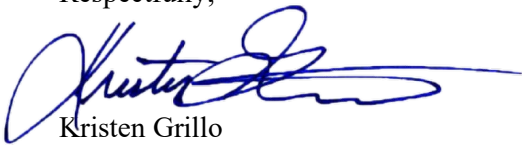
Melanie Bachman, Esq.
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: PETITION NO. 1278B - Bloom Energy Corporation, as an agent for Medtronic Inc., second request to amend to its declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, operation and maintenance of an additional customer-side 2,000-kilowatt fuel cell facility to be located at the Medtronic campus, 195 McDermott Road, North Haven, Connecticut.

Dear Ms. Bachman:

Please see the attached responses to interrogatories provided to Bloom Energy on August 28th, 2023.

Respectfully,



Kristen Grillo
Senior Permitting Specialist | East Coast Field Office
Customer Installations Group | North America
(917) 803-4511
Kristen.Grillo@bloomenergy.com



Bloom Energy Corporation
4353 North First Street, San Jose, CA 95134
408 543 1500
www.bloomenergy.com

**Petition No. 1278B
Bloom Energy Corporation (Bloom)
Medtronic Campus
195 McDermott Road, North Haven**

**Interrogatories - Responses
August 28, 2023**

Notice

1. Referencing Petition page 11 has Bloom received any comments from the Town of North Haven, Town of East Haven, City of New Haven or abutting property owners since the request to amend the declaratory ruling was submitted to the Council? If yes, summarize the comments and state how the comments were addressed.

Response: No comments have been provided to Bloom by the Town of North Haven, Town of East Haven, City of New Haven, or abutting property owners.

Project Development

2. Is the project, or any portion of the project, proposed to be undertaken by state departments, institutions or agencies, or to be funded in whole or in part by the state through any contract or grant?

Response: No, this project or any portion of it is not proposed to be undertaken by state departments, institutions, or agencies. It will also not be funded in whole or in part by the state through any contract or grant.

3. What is the estimated cost of the proposed project?

Response: The estimated cost of the proposed project is \$3,143,085.

4. Would the project participate, or was the project selected, in a state or public utility-sponsored program?

Response: No, this project will not participate in a state or public-utility sponsored program.

5. Referencing Petition pp. 3-4, “the operational life of the facility is for the life of the 6-year contract.” What is the estimated useful life of the facility beyond the contract term?

Response: The facility components have an estimated useful life of approximately 10 years.



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Proposed Site

6. Provide the distance, direction and address of the nearest property line and nearest residence from the proposed facility.

Response: The address of the nearest property line is 171 McDermott Road, located approximately 272 feet North from the proposed facility. The nearest residence is located at 31 Quinnipiac Avenue, approximately 1220 feet southeast from the proposed facility.

7. Referring to Petition Exhibit 2, how many acres comprise the 195 McDermott Road parcel?

Response: The 195 McDermott Road parcel is 31.34 acres.

Interconnection

8. Referencing Petition p. 4, what is the status of the Interconnection Application? Is approval expected in September 2023 rather than September 2024?

Response: The application is under initial technical review. The need for any further review is unknown at this time. Bloom does not expect approval in September 2023.

9. Is the project interconnection required to be reviewed by ISO-NE?

Response: UI is required to submit a form for routine approval by ISO-NE on a monthly agenda.

Public Safety

10. Referencing Petition p. 5, identify media to be used for pipe cleaning procedures at the proposed facility in accordance with Public Act 11-101, An Act Adopting Certain Safety Recommendations of the Thomas Commission.

Response: Nitrogen will be used for the pipe cleaning procedures at the proposed facility.

11. What security measures would be employed to protect the fuel cell units/components from vandalism or intrusion?

Response: The fuel cells are tamper-proof; the internal components of the system cannot be accessed without a unique key that is needed to open the servers, preventing anyone that is non-essential personnel from accessing them.



What Powers You

12. Would the proposed facility be protected by a fence and/or bollards? If yes, provide detail. If no, is such protection necessary?

Response: The proposed gas meter and gas regulator will be protected by existing bollards. No fence or bollards are needed for the energy servers or other components, as they are located in a private and controlled area (private drives) where the maximum speed limit is at or below 15 mph and traffic is limited. The servers and electrical equipment are set back within a landscape area and are located 8' and 12', respectively, from a raised curb which would deflect or deter vehicles from accidental impact.

13. Referring to Petition p. 5, Footnote 2, the 2015 edition of the National Fire Protection Association (NFPA) 853 standard is referenced. However, the State of Connecticut has adopted the 2020 NFPA standard. Would the proposed facility be installed in accordance with the most recent standards?

Response: Yes, the proposed facility will be installed in accordance with the most recent NFPA standards.

14. Could the construction or operation of the proposed facility impact or interfere with any existing utilities or infrastructure within the project area? If so, identify any measures that would be employed to protect existing utilities or infrastructure from impact or interference.

Response: No, the construction or operation of the proposed facility will not impact or interfere with any existing utilities or infrastructure within the project area. The facility has been located and designed in coordination with Medtronic operations personnel at the North Haven complex. Bloom anticipates continued close coordination.

15. Is notification to the Federal Aviation Administration required for the proposed facility? Would cranes be used for construction that could pose a hazard to aircraft? What is the overall height of the proposed facility? What is the overall height of the adjacent building?

Response: Notification to the Federal Aviation Administration (FAA) is not required for the facility, but is required for the temporary use of a crane for installation of the facility. Bloom will make the required filing to the FAA prior to construction. The overall height of the proposed facility is approximately 7 feet. The adjacent building (at 195 McDermott Road) is estimated to be 30-35 feet tall, excluding mechanical appurtenances on its rooftop. Other nearby buildings on the Medtronic complex are of comparable or greater height.



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Environmental Effects and Mitigation Measures

16. Referring to Petition p. 6, what is the status of the DEEP Natural Diversity Database review?

Response: The DEEP Natural Diversity Database review was completed on August 4th. DEEP issued a determination letter, confirming that there are no species of concern at the proposed facility location. Please see Attachment #1.

17. The Petition Noise Survey states traffic count data was incorporated into the noise model. Was the operation of the two existing fuel cells also incorporated into the noise model? If not, why were the existing fuel cells excluded?

Response: The operation of the two existing fuel cells were not incorporated into the initial noise survey presented. Please see Attachment #2 for the revised noise study, which now incorporates the two existing fuel cells into the noise model.

18. Is any portion of the facility site located on prime farmland soils? If so, what is the area of on-site prime farmland soils? Under Regulations of Connecticut State Agencies §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.

Response: There are no prime farmland soils on either the facility site or the property.



Attachment #1: DEEP Natural Diversity Database Review



79 Elm Street • Hartford, CT 06106-5127

www.ct.gov/deep

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8/4/2023

Dean Gustafson
BLOOM ENERGY CORPORATION
4353 N 1st St
San Jose, CA 95134
dgustafson@allpointstech.com

Subject: Medtronic Inc Fuel Cell Facility
Filing # 99595
NDDDB – New Determination Number: 202305670
195 McDermott Rd
North Haven

Expiration Date: 8/4/2025

Based on current data maintained by the Natural Diversity Database (NDDDB) and housed in the DEEP ezFile portal, no extant populations of Federal or State Endangered, Threatened or Special Concern species (RCSA Sec. 26-306) are known to occur within the project area delineated for the Energy and Utility Production Facilities and Distribution Infrastructure / New facility construction, Medtronic Inc Fuel Cell Facility.

This NDDDB – New determination may be utilized to fulfill the Endangered and Threatened Species requirements for state-issued permit applications, licenses, registration submissions, and authorizations. However, please be aware of the following limitations and conditions:

- This determination does not preclude the possibility that listed species may be encountered on site. Should this occur, a report must be submitted to the Natural Diversity Database promptly and additional action may be necessary to remain in compliance with certain state permits. Please fill out the [appropriate survey form](#) and follow the instructions for submittal.
- If your project involves preparing an Environmental Impact Assessment, this NDDDB consultation and determination should not be substituted for conducting biological field surveys assessing on-site habitat and species presence.
- This determination applies only to the project as described in the submission and summarized at the end of this letter. Please re-submit an updated Request for Review if the project's scope of work and/or timeframe changes, including if work has not begun by 8/4/2025.

The NDDDB – New determination for the Medtronic Inc Fuel Cell Facility at 195 McDermott Rd, North Haven as described in the submitted information and summarized at the end of this document is valid for two years from the date on this letter.

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available.

This letter is computer generated and carries no signature. If however, any clarification is needed, or if you have further questions, please contact the following:

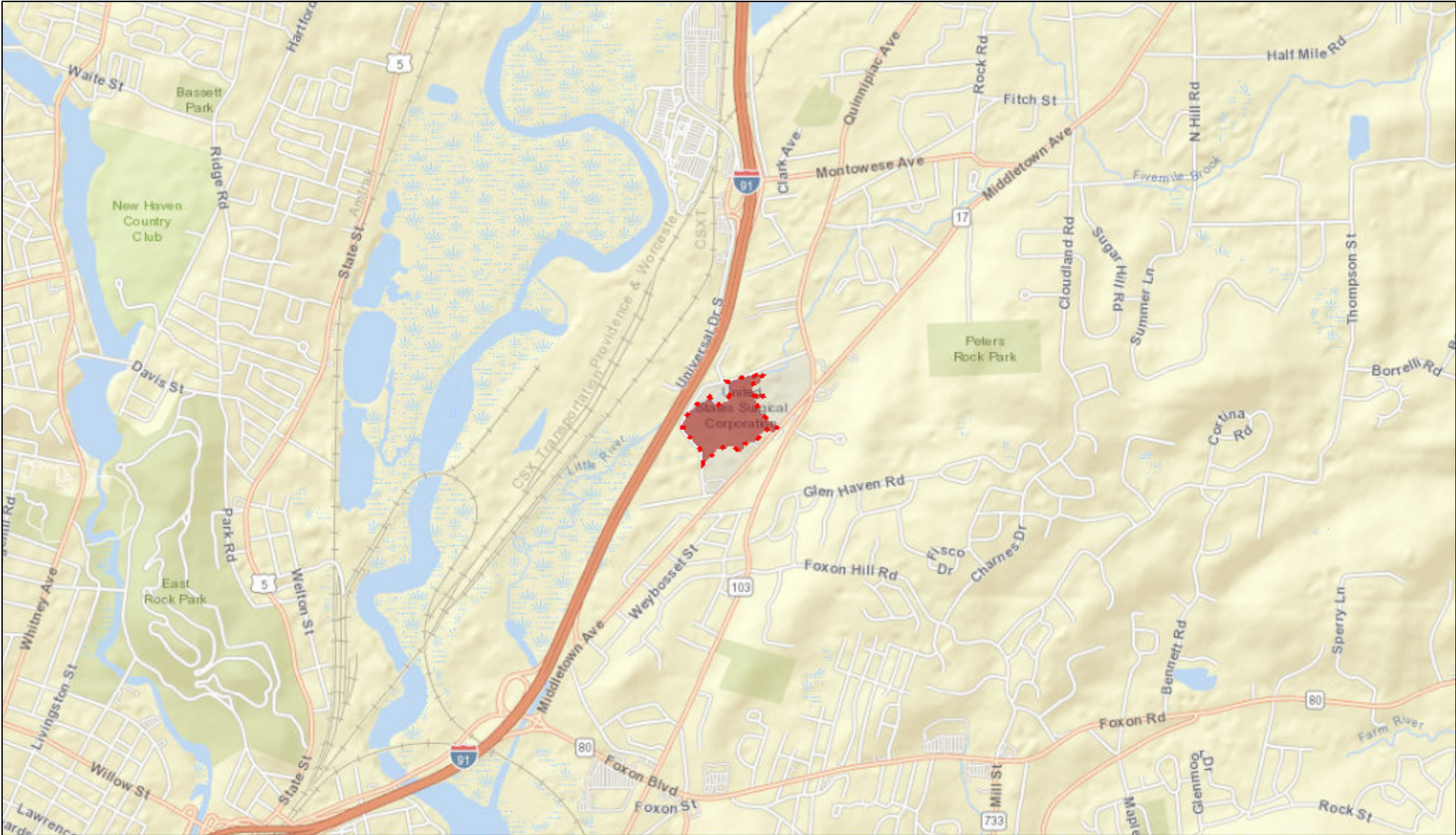
CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database
79 Elm Street, 6th floor
Hartford, CT 06106-5127
(860) 424-3011
deep.nddbrequest@ct.gov

Please reference the Determination Number provided in this letter when you e-mail or write. Thank you for submitting your project through DEEP's ezFile portal for Natural Diversity Database reviews.

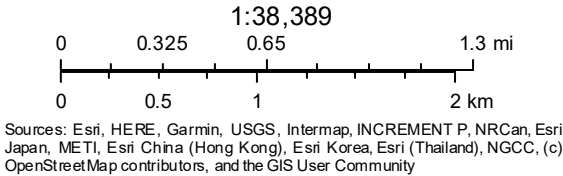
Application Details:

Project involves federal funds or federal permit:	No
Project involves state funds, state agency action, or relates to CEPA request:	No
Project requires state permit, license, registration, or authorization:	Yes
DEEP enforcement action related to project:	
Project Type:	Energy and Utility Production Facilities and Distribution Infrastructure
Project Sub-type:	New facility construction
Project Name:	Medtronic Inc Fuel Cell Facility
Project Description:	

Medtronic Inc Fuel Cell Facility Map



August 3, 2023



Attachment #2: Updated Noise Study

September 11, 2023

Bloom Energy
4353 North 1st Street
San Jose, California 95134

Attention: **Brandon Leaverton | Supply Chain Specialist – Construction**

Subject: **MDC002.B2 Medtronic Inc.; North Haven, Connecticut**
Property Line Noise Analysis
Veneklasen Project No. 4631-044

Dear Brandon:

Veneklasen Associates, Inc. (Veneklasen) was contracted to evaluate noise impact of proposed fuel cells for the subject project in North Haven, Connecticut. This report includes predicted noise levels at adjacent property lines and an evaluation of necessary mitigation, if warranted, to comply with the local noise ordinance in the surrounding community. This report documents our acoustical comments.

Noise Criteria

The Town of North Haven, Connecticut Code of ordinance Chapter 146 “Noise”, Section 146-4(B) provides property line noise limits for various property types. These are summarized below in Table 1.

Table 1. Town of North Haven Noise Limits

Zone in which Emitter is located	Zone in which Receptor is located			
	Industrial	Commercial	Residential/Day	Residential/Night
Residential and Limited Commercial	62 dBA	55 dBA	55 dBA	45 dBA
Commercial	62 dBA	62 dBA	55 dBA	45 dBA
Industrial	70 dBA	66 dBA	61 dBA	51 dBA

Additionally, Section 146-4(C) states the following:

In those individual cases where the background noise levels caused by sources not subject to this chapter exceed the standards contained herein, a source shall be considered to cause excessive noise if the noise emitted by such source exceeds the background noise levels by five dBA, provided that no source subject to the provisions of this chapter shall emit noise in excess of 80 dBA at any time, and provided that this section does not decrease the permissible noise level standards of Subsection B of this section.

Veneklasen assumes proposed fuel cells will run 24-hours per day. According to the Town of North Haven Zoning Map, all adjacent properties are zoned as commercial. In the following analysis, fuel cell noise levels are compared to the applicable limits described above.

Existing Ambient Noise

To determine the ambient noise levels at the site due to existing traffic sources and existing fuel cells, Veneklasen utilized the SoftNoise Predictor Version 2023.01 environmental noise modelling computer software. Traffic counts for the nearby roadways were provided by the Connecticut Department of Transportation (CTDOT). The primary noise source is vehicular traffic on Interstate 91 and Middletown Avenue.

Client shared information regarding existing fuel cells, which includes sound pressure levels. Using this information, sound power levels were calculated. See Appendix A below for existing fuel cells cut sheets used in the following analysis.

The Predictor software utilizes the three-dimensional locations of roadways and sensitive receptors, shielding provided by terrain and existing structures, traffic count data, as well as other attributes of the roadway, to calculate average daytime and nighttime noise levels. Note that receptors east of Middletown Avenue will experience daytime ambient levels less than 62 dBA and therefore not be subject to noise limit modification. Daytime ambient levels for receptors closer to Middletown Avenue and on McDermott Road are summarized below in Table 2. Modified ambient noise levels are also included.

Table 2. Average Daytime Ambient Traffic Noise Levels and Existing Fuel Cells

Receptor Location	Calculated Traffic Daytime Average Level, dBA	Calculated Existing Fuel Cells Daytime Average Level, dBA	Noise Limit, dBA
171 McDermott Rd.	62	46	67
34 Middletown Ave.	47	48	62
40 Middletown Ave.	57	48	62
50 Middletown Ave.	57	47	62
60 Middletown Ave.	49	49	62

Note that daytime ambient levels at the 171 McDermott Rd location exactly meet the property line noise limit defined in Table 1 above and do not exceed this limit. Therefore, no allowances for existing ambient are applicable for this location.

Property Line Noise Analysis

Drawings dated December 5, 2022 indicate that proposed fuel cells will be installed in the east courtyard area of the existing property. Proposed fuel cells are shown in green in Figure 1 below. Additionally, the nearest receptors are annotated in blue.

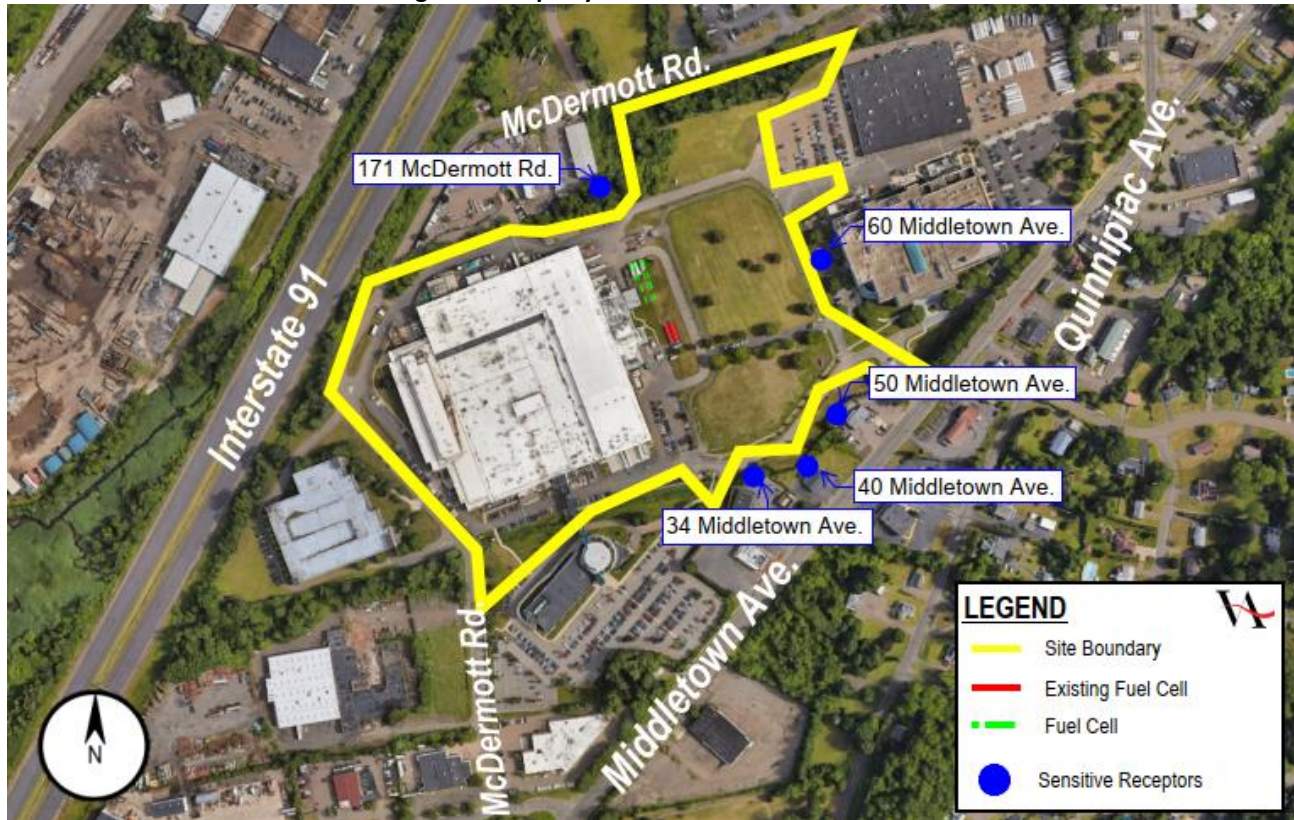
The current fuel cell installation method includes a foam dampening material that is installed at the doors and exhaust to the fuel cells. Measurement data of these units when compared to units without foam indicates that the foam compound reduces noise levels produced by the fuel cells by approximately 5 decibels. See Appendix A below for fuel cell sound power data and foam compound reduction data used in the following analysis.

The calculated fuel cell noise levels as compared with State noise level limits are presented in Table 3 below. Note that the reported distances between property lines and the fuel cells are taken from the closest face of the fuel cell nearest to the associated property line.

Table 3. Fuel Cell Property Line Noise Levels: No Mitigation

Sensitive Receptor	Distance from Fuel Cell, ft	Applicable Noise Limit, dBA	Calculated Fuel Cell Noise Level, dBA	Code Compliant?
171 McDermott Rd.	272	67	43	Yes
34 Middletown Ave.	630	62	39	Yes
40 Middletown Ave.	690	62	38	Yes
50 Middletown Ave.	656	62	38	Yes
60 Middletown Ave.	495	62	40	Yes

Figure 1. Property Line and Fuel Cell Locations



Summary

Veneklasen has reviewed the subject project proposed fuel cell property line noise levels as they pertain to the Town noise requirements. Adjacent properties are zoned as commercial land.

As currently designed, fuel cell noise levels comply with Town requirements. Therefore, no noise mitigation is required for the subject project.

If you have any questions, please do not hesitate to call.

Sincerely,
Veneklasen Associates, Inc.

David Varela
Associate

John LoVerde, FASA
Principal

Appendix A – Existing Fuel Cells Cut Sheets

Energy Server 5		Technical Highlights (ES5-EA2AAN)	
Outputs			
Nameplate power output (net AC)		250 kW	
Load output (net AC)		250 kW	
Electrical connection		480V, 3-phase, 60 Hz	
Inputs			
Fuels		Natural gas, directed biogas	
Input fuel pressure		10-18 psig (15 psig nominal)	
Water		None during normal operation	
Efficiency			
Cumulative electrical efficiency (LHV net AC) ¹		65-53%	
Heat rate (HHV)		5,811-7,127 Btu/kWh	
Emissions ²			
NOx		0.0017 lbs/MWh	
SOx		Negligible	
CO		0.034 lbs/MWh	
VOCs		0.0159 lbs/MWh	
CO ₂ @ stated efficiency		679-833 lbs/MWh on natural gas; carbon neutral on directed biogas	
Physical Attributes and Environment			
Weight		13.6 tons	
Dimensions (variable layouts)		14'4" x 8'8" x 6'9" or 28'8" x 4'4" x 7'2"	
Temperature range		-20° to 45° C	
Humidity		0% - 100%	
Seismic vibration		IBC site class D	
Location		Outdoor	
Noise		< 70 dBA @ 6 feet	
Codes and Standards			
Complies with Rule 21 interconnection and IEEE1547 standards			
Exempt from CA Air District permitting; meets stringent CARB 2007 emissions standards			
An Energy Server is a Stationary Fuel Cell Power System. It is Listed by Underwriters Laboratories, Inc. (UL) as a 'Stationary Fuel Cell Power System' to ANSI/CSA FC1-2014 under UL Category IRGZ and UL File Number MH45102.			
Additional Notes			
Access to a secure website to monitor system performance & environmental benefits			
Remotely managed and monitored by Bloom Energy			
Capable of emergency stop based on input from the site			

¹ 65% LHV efficiency verified by ASME PTC 50 Fuel Cell Power Systems Performance Test

² NOx and CO measured per CARB Method 100, VOCs measured as hexane by SCAQMD Method 25.3

Technical Highlights (ES5-AA1AA0)	
Outputs	
Nameplate power output (net AC)	262.5 kW
Base load output (net AC)	250 kW
Electrical connection	480 V, 3-phase, 60 Hz
Inputs	
Fuels	Natural gas, directed biogas
Input fuel pressure	10-18 psig (15 psig nominal)
Water	None during normal operation
Efficiency	
Cumulative electrical efficiency (LHV net AC)*	65-53%
Heat rate (HHV)	5,811-7,127 Btu/kWh
Emissions	
NO _x	< 0.01 lbs/MWh
SO _x	Negligible
CO	<0.05 lbs/MWh
VOCs	< 0.02 lbs/MWh
CO ₂ @ stated efficiency	679-833 lbs/MWh on natural gas; carbon neutral on directed biogas
Physical Attributes and Environment	
Weight	14.3 tons
Dimensions (variable layouts)	14'9" x 8'9" x 7' or 29'6" x 4'5" x 7'5"
Temperature range	-20° to 45° C
Humidity	0% - 100%
Seismic vibration	IBC site class D
Location	Outdoor
Noise	< 70 dBA @ 6 feet
Codes and Standards	
Complies with Rule 21 interconnection and IEEE1547 standards	
Exempt from CA Air District permitting; meets stringent CARB 2007 emissions standards	
Product Listed by Underwriters Laboratories Inc. (UL) to ANSI/CSA FC 1-2014	
Additional Notes	
Access to a secure website to monitor system performance & environmental benefits	
Remotely managed and monitored by Bloom Energy	
Capable of emergency stop based on input from the site	

Appendix B – Sound Power Levels

Sound power data was taken from the Mei Wu Acoustics (MWA) Report titled “Bloom Energy – ES5 Linear Sound Power Measurement”, dated June 21, 2016. These reported levels were measured without the sound dampening foam described above.

Table 4. Fuel Cell Measured Sound Power Levels

Dampening Product Installed?	Measured Sound Power Level [dB] – 1/1 Octave Bands							LwA
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
No	77.9	80.9	84.1	82.3	80.5	76.9	69.4	84.9
Yes	77.9	80.9	81.0	77.9	73.7	67.2	64.8	79.3

In a study conducted at an existing installation of the fuel cell systems, measurements were taken of the fuel cell banks with and without the dampening product. The Noise Reduction (NR) of the dampening product was calculated by taking the difference of these measured values at octave band frequencies. Note that no significant reduction was shown at the 63 Hz and 125 Hz bands. The modified sound levels for the fuel cells that were utilized in calculations shown in this report are shown in Table 4.

Table 5. Measured Sound Dampening Foam Mitigation

Condition	Measured Sound Pressure Level [dB] @10ft – 1/1 Octave Band				
	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
No Foam	70.8	66.8	65.5	62.4	53.6
Foam	67.8	62.5	58.7	52.8	49.0
Difference (NR)	3.1	4.4	6.8	9.7	4.6

Appendix C – Calculation Methods

Sound level attenuates over distance by a factor of -6 dB per doubling of distance. For example, if a sound source was measured to be 60 dBA at a distance of 10 feet, the measured sound level at 20 feet would be 54 dBA. Sound level reduction due to distance is calculated according to the following equation:

$$L_p = L_w + 10 \log_{10} Q - 20 \log_{10} d - 0.7$$

Where:

d = The distance between the center of the fuel cell unit to the property line in feet.

L_p = The sound pressure level at a distance d in decibels.

L_w = The sound power level from the fuel cell. Sound power levels are reported above in Appendix A in decibels.

Q = The directivity factor which dictates how sound radiates outward from the source. See Figure 2 below from the 2015 American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) Handbook, Chapter 48 describing Q factors and their associated sound radiation patterns.

Figure 2. ASHRAE Handbook: Q Factor Sound Radiation Patterns

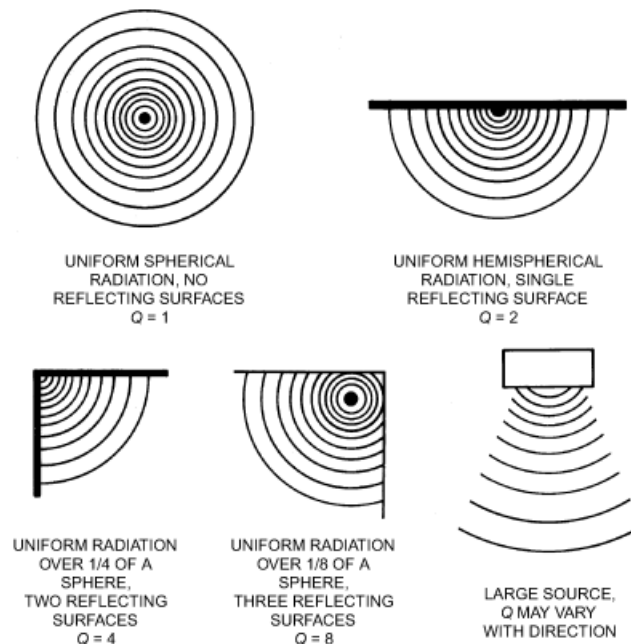


Fig. 30 Directivity Factors for Various Radiation Patterns

In the equation above, the greater the distance away from the sound source (d), the lower the sound level. This is intuitive and most people would consider this common knowledge.

In general, the more reflecting surfaces there are adjacent to a noise source, the more sound will bounce off these surfaces and radiate outward. In other words, larger Q factors will increase the noise level. For example, a fuel cell sitting on the ground, with nothing else around, would have a Q factor of 2 because the ground that the fuel cell is sitting on acts as a single reflecting surface. Another example would be a fuel cell sitting on the ground with a retaining wall on one side of it; this system would have a Q factor of 4 because both the ground and the retaining wall act as reflecting surfaces. A doubling of the Q factor increases the receiver noise level, L_p , by 3 dB.