STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

August 9, 2024

John Prinssen
HyAxiom, Inc.
101 East River Drive
East Hartford, CT 06108
john.prinssen@doosan.com

RE: **PETITION NO. 1633 -** HyAxiom, Inc. petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a grid-side 4.939-megawatt fuel cell facility and associated equipment to be located at 540 Longbrook Avenue, Stratford, Connecticut, and associated electrical interconnection. **Council Interrogatories to Petitioner.**

Dear John Prinssen:

The Connecticut Siting Council (Council) requests your responses to the enclosed questions no later than August 29, 2024. Please submit an original and 15 copies to the Council's office and an electronic copy to siting.council@ct.gov. In accordance with the State Solid Waste Management Plan and in accordance with Section 16-50j-12 of the Regulations of Connecticut State Agencies, the Council requests all filings be submitted on recyclable paper, primarily regular weight white office paper. Please avoid using heavy stock paper, colored paper, and metal or plastic binders and separators. Fewer copies of bulk material may be provided as appropriate.

Please be advised that the original and 15 copies are required to be submitted to the Council's office on or before the August 29, 2024, deadline.

Copies of your responses are required to be provided to all parties and intervenors listed in the service list, which can be found on the Council's website under the "Pending Matters" link.

Any request for an extension of time to submit responses to interrogatories shall be submitted to the Council in writing pursuant to §16-50j-22a of the Regulations of Connecticut State Agencies.

Sincerely,

Melanie Bachman
Executive Director

MAB/IN/dll

Enclosure: Schedule, dated August 9, 2024

c: Service List, dated June 6, 2024

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REVISED SCHEDULE

PETITION NO. 1633- HyAxiom, Inc. petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a grid-side 4.939-megawatt fuel cell facility and associated equipment to be located at 540 Longbrook Avenue, Stratford, Connecticut, and associated electrical interconnection.

Petition received	06/05/2024
Public Comment Period Deadline	07/05/2024
Council 60-day Action – Set Date for Decision to 12/02/2024	07/18/2024
Deadline for Action	08/04/2024
Council Interrogatories • Set-One Issued • Set-One Responses Due	 08/09/2024 08/29/2024
Deadline for Decision	**12/02/2024**

Petition No. 1633
HyAxiom, Inc.
540 Longbrook Avenue
Stratford, CT

Interrogatories
August 9, 2024

Notice

1. Referencing page 12 of the Petition, has HyAxiom, Inc. (HyAxiom) received any comments from municipal officials and/or any abutting property owners since the petition was submitted to the Council If so, please summarize the comments and how these comments were addressed. No comments have been received by abutters. CTDOT did comment through the CSC regarding their proposed easement which has been addressed with both the Town of Stratford and the CTDOT.

2. Referencing page 14 of the Petition, provide details of meetings with municipal officials including names, dates and comments. Multiple on line & in person meetings have taken place with the Town of Stratford.
   Town officials include:
   Mary Dean - economic development, John Casey-town engineer, Andrea Boissevain - Director of Health, Alivia Coleman - Dept of Health, Jay Habansky - Planning and Zoning

   Recent meeting include:
   May 24, 2024 -On site meeting at Stratford to discuss project details.
   July 22, 2024 – Team's meeting with town to discuss project details and timeline.
   August 1, 2024 – Team's meeting with DOT and Town of Stratford to discuss DOT project and adjustments needed for layout of fuel cells project. Solution plan agreed to by all parties.
   Aug 6, 2024 – Onsite meeting at HyAxiom to have town official observe other HyAxiom projects to observe operational fuel cells.

Project Development

3. What is the estimated cost of the proposed project? Approximately 5 million dollars.

4. How would the fuel cell units be delivered to the site? The fuel cells and associated equipment will be delivered to the site by tractor trailer and rigged into place using a crane.

5. 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? The project is privately funded.

6. If the facility operates beyond the Shared Clean Energy Facilities (SCEF) Agreement, will HyAxiom decommission the facility or seek other revenue mechanisms for the power produced by the facility? This SCEF project has a twenty-year duration. Absent any subsequent agreements and PURA approval of the subsequent agreements the project will be decommissioned at the conclusion of the present agreement.

Proposed Site

7. Submit a map clearly depicting the boundaries of the fuel cell facility site, DOT construction and permanent easements and the boundaries of the host parcel. 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. Map attached (1). DOT permanent easement shown in red with DOT temporary construction easement shown in pink.

8. Provide the size/area of the host parcel in acres. The entire parcel measures 10.5 acres. The lease area is .341 acres.

9. Referencing Petition Attachment 2 and the revised site plans provided on August 8, 2024, what is the size of the original lease area in acres? Provide the revised size of the lease area in acres and the size of the facility compound, if different. Original lease area shown in Petition Attachment 2 was 0.413 Acres. The new proposed area, including 20' along the south edge of the pad for drainage (shown in blue on new attachment (6), exact required area still to be determined) is 0.426 Acres.

10. What is the general slope/gradient of the project site? The site is generally flat with slopes up to the surrounding roadways to the West and North.

11. Has soil testing occurred for contamination related to previous activities? Would site remediation be required prior to the commencement of facility construction? If so, how would that affect the project construction timeline? Removal of impacted soils is ongoing and will likely push the fuel cell construction completion schedule into Q1 of 2025.

12. Provide the distance and direction to the nearest property line from the proposed fuel cell facility. 70 meters to the SW. (non residential empty lot)

13. What is the distance and direction of the nearest residential structure from the proposed fuel cell facility? Provide the address. Approx. 78 meters to the NW. 586 Longbrook Ave

14. Describe the surrounding land uses adjacent to the host parcel? CA Retail Commercial to the Southwest, RS 4 residential to the Northwest, MA light industrial to the Northeast, CA Retail Commercial to the South (across the railroad tracks).

15. Provide the size of the DOT construction and permanent easements.
The DOT permanent easement is ~3,115 ft^2. See updated site layout drawings for dimensions (attachment 6). DOT Construction easement is ~680 ft^2 providing an additional 11' parallel off the north end of the permanent easement and meeting the permanent easement at the south end.

16. Provide the distance of the DOT construction easement and permanent easement from the following points:

    a) The site boundaries;12' from the Easement to the West edge of the Facility.
    b) The perimeter fence; 12' 6" from the easement to the fence.
    c) The fuel cells; 6' from the corner of the nearest fuel cell
    d) The electrical and gas equipment. ~75' to the nearest site electrical equipment. ~100' from the primary gas regulator vault; ~22' from the nearest gas connection at the fuel cell.

Proposed Facility and Associated Equipment

17. Referencing the revised site plan, do the circles along the perimeter fence represent bollards to prevent vehicle impact to the proposed fuel cell facility? If not, what do the circles represent? Referencing the revised site plan the green area represents the concrete pavement which will be completely encircled by fencing. Further to the North and to the west there are metal beam guardrails along Longbrook and the access road protecting the site from vehicular traffic.

18. Please provide a detailed site plan for the proposed facility including but not limited to, the dimensions and location of the proposed fuel cell facility, cooling module, concrete pads, fence design and bollards (if applicable) and utility connections. Additional detail and dimensions added to Updated Concept Drawings on attachment (6)

19. Referencing Petition P. 3 provide more details/information on the future tenants that will utilize the space heat and hot water? Where would the tenancy buildings be located? At present there are no identified off-takers for the thermal energy from this project. As the remainder of the parcel is developed the option of providing thermal energy from the fuel cells will remain open and available.

20. Petition p. 12 states that the "Fuel Cell Facility will be located some 12' below street level." Would a retaining wall be required? If so, provide details of the retaining wall within the revised site plan. No retaining wall will be required. There will be an embankment formed within the proposed CTDOT easement which will be built to current CTDOT embankment standards.

Electrical Interconnection

21. Would the revised electrical interconnection be above ground or via underground conduit? The proposed connection will be made from underground at UI pole #7623.

22. Has an interconnection study been conducted by The United Illuminating Company (UI)? If so, what is the status of the interconnection study? Has the revised site plan been submitted to UI and how does this impact the interconnection review? The initial interconnect study is in process and is scheduled to be completed soon.

23. Is the project interconnection required to be reviewed by ISO-NE? There is no known requirement for ISO-NE review due to the total power output of the Facility being below 10 MW.

24. Petition Attachment 1 shows three 3000 kVA liquid filled transformers to be installed, however the revised August 8, 2024 site plan shows two 2500 kVA transformers and one 1500 kVA transformer. Please clarify and provide a one line electrical drawing for the revised site plan. Due to extreme long lead times to acquire switchgear the original design of utilizing three 3000kVA transformers is being used. One line is attached (2).

25. Will the transformers have secondary containment? There is no secondary containment included in the current design. Transformers will contain environmentally friendly biobased FR3 oil.

Public Health and Safety

26. Petition P. 6 references the "Ansonia SCEF Emergency Response Plan". Please clarify. Provide a revised ERP without cross outs. The Emergency Response Plan and associated references to it were offered as a sample. The final plan will be developed in consultation with local First Responders and HyAxiom Safety personnel. A clean copy of the sample plan is attached (3).

27. Does the Petitioner intend to provide the Emergency Response Plan (ERP) to local emergency responders and provide on-site training? HyAxiom will work in consultation with local First Responders to develop the final site-specific ERP.

28. Referring to Petition Attachment 10, Table 6, does the second column reference the distances to the residential structures or the residential property lines. Table 6 column 2 refers to the distance to the property lines.

29. How does the revised site plan impact the results of the acoustic site survey report? Would the proposed facility still be compliant with DEEP Noise Control Regulations? The Facility is expected to remain in compliance with noise regulations as the changes made to the layout were minor. Further the proposed road profiles being raised during the CTDOT work will aid in blocking fugitive noise from the surrounding neighbors to the Northwest.

30. The acoustic site survey report has figures and maps that are dark and not legible. Provide a noise study with color figures and maps that are legible. See the attached (4) full color version of the study.

31. Provide the estimated noise levels at the nearest property line. 585 Longbrook Ave. 78 meters from the fuel cell yard. 42.4 dBA

32. What is the distance of the revised facility fence line and fuel cell units to the railroad tracks? How would the proposed fuel cell facility be protected from a train derailment? The distance from the railroad tracks to the closest point of the fuel cell fence line is some 56'. No train derailment protection is currently incorporated in the design.

33. If the circles along the fence line on the revised site plan represent nitrogen bottles, they are in very close proximity to the construction easement on the western site boundary, what measures are proposed to avoid accidental collision? Can these nitrogen bottles be relocated? How many nitrogen bottles are located on the site? A total of 110 bottles will be used for the site. A temporary construction clearance of 12' from the easement to the fence line in order to facilitate access was agreed upon by HyAxiom, CTDOT and the Town of Stratford. No permanent protection measures are proposed for this elevation. CTDOT will be responsible for temporary protection of the Facility which is outside their proposed easement.

34. Referencing Petition Attachment 4, are nitrogen tank leaks or ruptures addressed in the Emergency Response Plan? If not, how would HyAxiom respond to any leaks or ruptures? As nitrogen is an inert gas some mention will be paid to the storage of the gas but only to the extent that it is pressurized as it poses no risk of fire or explosion while on the site and there is little risk to service personnel.

35. Which National Fire Protection Association (NFPA) or other codes and standards apply to fuel cell construction, installation and/or modifications? NFPA 853 encompasses specific codes for the construction of fuel cell facilities. All IBC codes as adopted by the State of CT and the Town of Stratford including NFPA 853 will be incorporated into the design of the Facility.

36. What security measures are proposed to protect the fuel cell facility from trespassing, theft, vandalism and/or sabotage? Climb resistant fencing and locking gates will be utilized for protection of the Facility.

37. Would the operation of the fuel cell facility produce any type of vapor plume or cloud? If so, is there a potential for icing in colder temperatures and/or a potential to interfere with air navigation? If so for both, are there any mitigation measures? Each fuel cell will produce a small plume of deionized water vapor which has been minimized through the inclusion of enhanced condensers in the current generation of fuel cells. Due to the total stack height of under 10' no interference with air navigation is expected.

38. Would 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. No interference or impact with existing infrastructure is expected during construction or operation of the fuel cell Facility.

39. Would a crane be required for construction? If yes, to what height would the crane boom be extended? Would notice to the Federal Aviation Administration be required for the temporary use of a crane? A crane with a total expected boom length 130' will be utilized for the construction of the Facility. Pursuant to 14CFR Part 77.9 no notification to the FAA is required.

Environmental Effects and Mitigation Measures

40. Referencing Petition P. 10, do the CO_2 emissions values include the utilization of waste heat? If not, provide the reduced CO2 emission values for the proposed facility after accounting for the use of waste heat. The values in Table 1 on page 10 remain constant whether thermal energy is utilized.

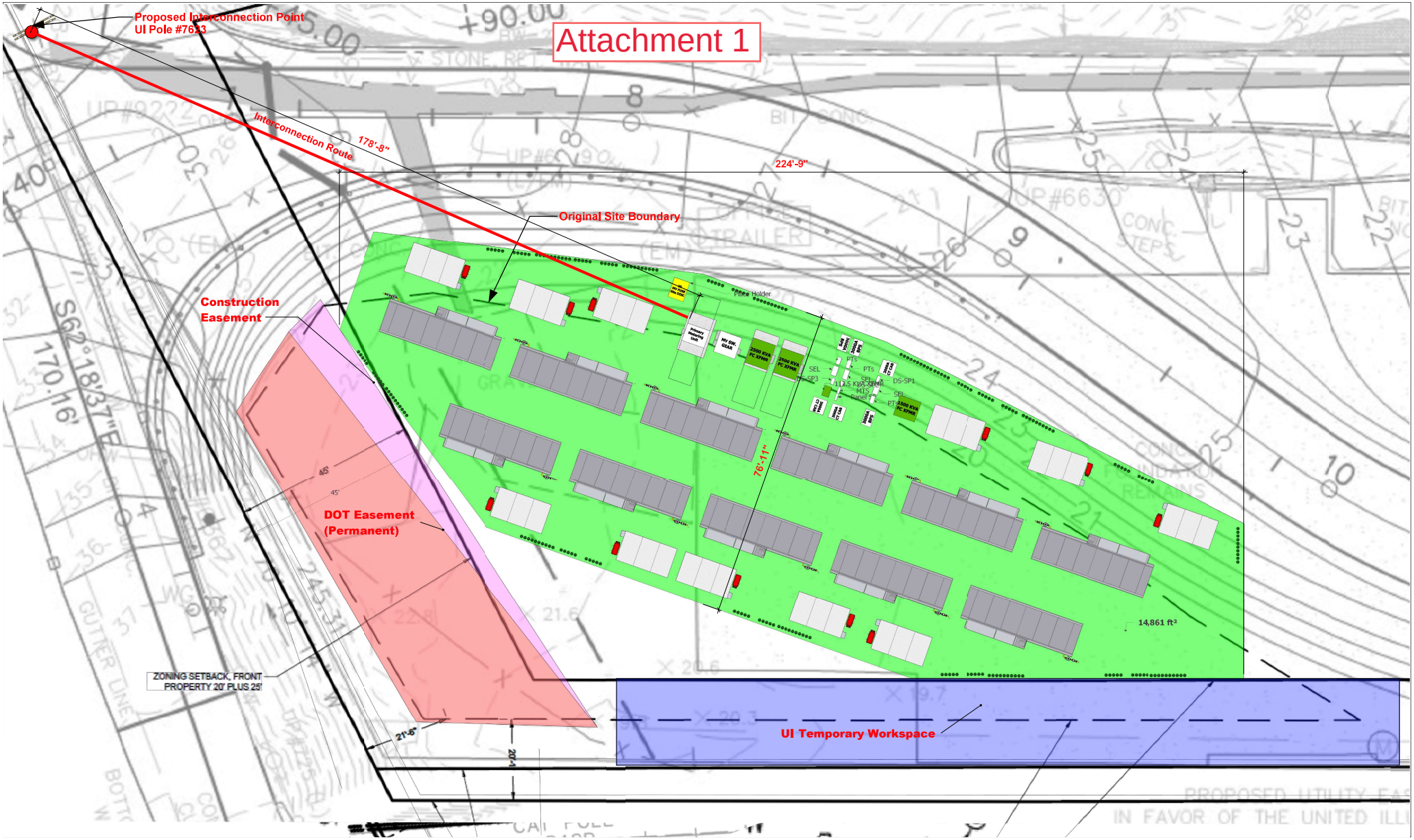
41. Is any portion of the project located on prime farmland soils? If so, what is the area of prime farmland soils that would be impacted by the proposed project? The Site is a State recognized brownfield and does not contain any Prime farmland.

42. Is the proposed site within a Coastal Boundary and if so, how would the development of the facility comply with the state Coastal Management Act? Provide a map. The Facility is not within the Coastal Site Boundary. See attached map (7).

43. Would erosion and sedimentation controls be installed consistent with the updated Connecticut Soil Erosion and Sediment Control Guidelines, effective March 30, 2024? Erosion and sedimentation controls will be installed and maintained in compliance with CT Guidelines during construction and until the disturbed area is stabilized.

44. Provide the total area (in acres) of the limits of disturbance for construction of the proposed facility. Total disturbed area will be .49 acres.

45. Describe the visibility of the proposed facility from the surrounding area. Provide photos of the proposed site. The Facility will be visible from Longbrook Ave. and the Access Rd. and will not be incongruent with the surrounding Light Industrial and commercial zoned areas. See attached photos (5).



GENERAL ARRANGEMENT

SCALE: 1"=10'

10' 50'

HyAxiom
A Doosan Company

540 LONGBROOK AVE, STRATFORD CT - FORMER CONTRACT PLATING SITE

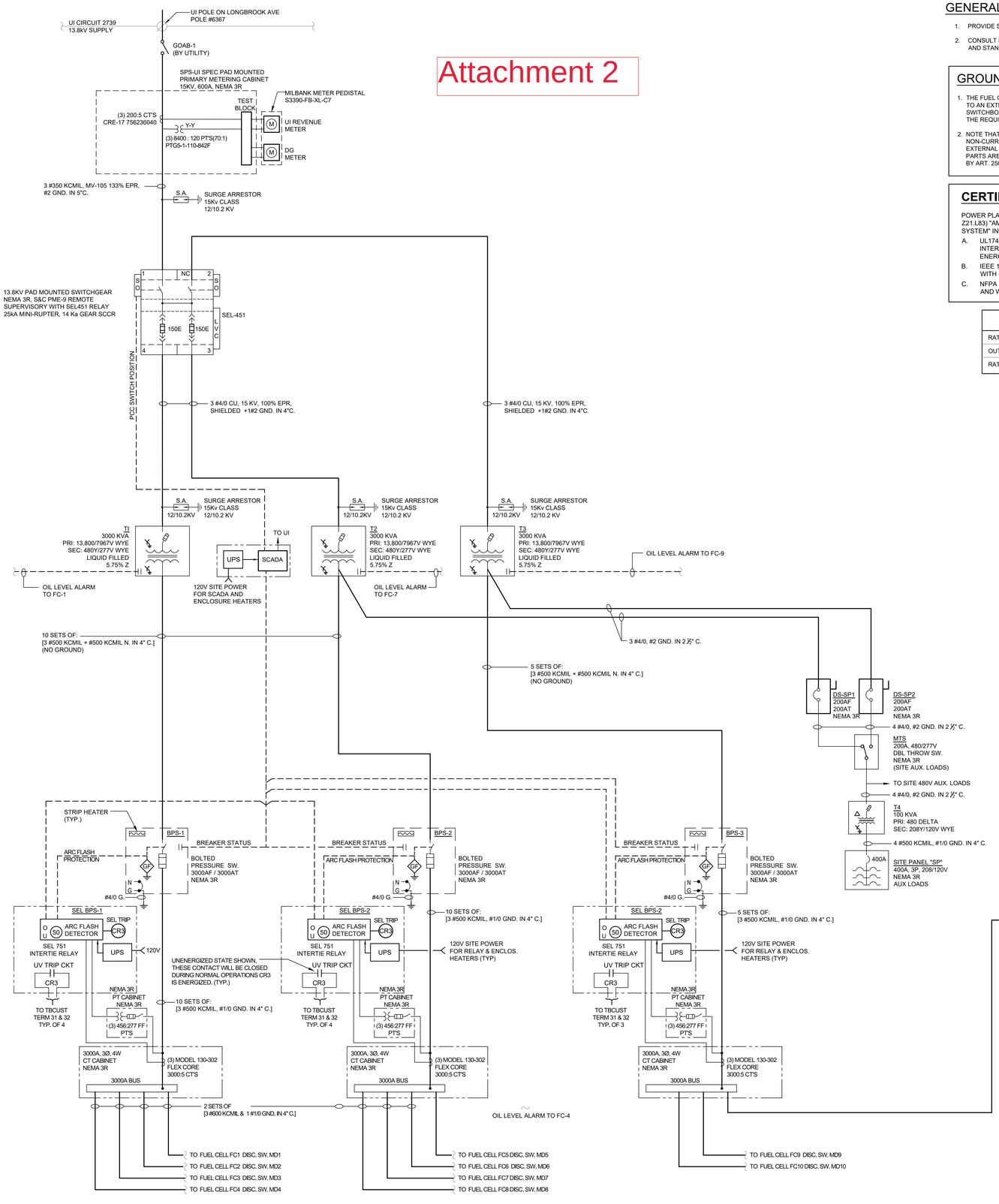
REVISIONS

	MM/DD/YY	REMARKS
1	04/08/24	Rev A01 - Concept Design for BCEF Round 5 Bid Review. Drawn By: A. Kellogg
2	07/29/24	Rev B01 - Updated Concept Design based on DOT Easement and UI Temporary Work Area
3	__/__/__	-
4	__/__/__	-
5	__/__/__	-

01

B

Attachment 2



GENERAL NOTES

1. PROVIDE SIGNAGE AS REQUIRED BY CODE AND AS INDICATED ON DWG E2.0.
2. CONSULT DOOSAN MODEL 400 INSTALLATION DESIGN GUIDE (FUEL CELL POWER PLANT) AND STANDARD INSTALLATION DRAWINGS FOR TECHNICAL REFERENCE.

GROUNDING NOTES:

1. THE FUEL CELL GROUND LUG INSIDE DISCONNECT SWITCH MD-1 SHALL BE CONNECTED TO AN EXTERNAL #1/0 COPPER EQUIPMENT GROUNDING CONDUCTOR FROM MAIN SWITCHBOARD'S GROUNDED CONDUCTOR PER NEC ART 692.44 , IN ORDER TO PROVIDE THE REQUIRED SINGLE POINT GROUND PER NEC ART 250.24.A & D.
2. NOTE THAT THE FUEL CELL GROUND LUG INSIDE MD-1 IS BONDED TO ALL METALLIC NON-CURRENT CARRYING METAL PARTS BOTH INSIDE THE FUEL CELL AND ALSO AT EXTERNAL FUEL CELL ASSEMBLIES SUCH AS THE COOLING MODULE, SO ALL FUEL CELL PARTS ARE CONNECTED TO THE EQUIPMENT GROUNDING CONDUCTOR AS REQUIRED BY ART. 250.110.

CERTIFICATION:

POWER PLANT IS CERTIFIED TO: ANSI/CSA AMERICA FC 1 - 2014 (FORMALLY ANSI Z21.L83) "AMERICAN NATIONAL STANDARD FOR STATIONARY FUEL CELL POWER SYSTEM" INCLUDING,

A. UL1741SA "INVERTERS, CONVERTERS, CONTROLLERS AND INTERCONNECTION SYSTEM EQUIPMENT FOR USE WITH DISTRIBUTED ENERGY RESOURCES."
B. IEEE 1547 "STANDARD FOR INTERCONNECTING DISTRIBUTED RESOURCES WITH ELECTRIC POWER SYSTEMS."
C. NFPA 70 NATIONAL ELECTRIC CODE (FOR INTERFACES TO CUSTOMER WIRING AND WIRING BETWEEN MODULES).

POWER PLANT SPECIFICATIONS

RATED POWER OUTPUT	454.45 kW / 532 kVA
OUTPUT TYPE	480VAC, 60 HZ, 3 PHASE, 3 WIRE
RATED OUTPUT CURRENT	639 AMPS AT RATED kVA

LEGEND

———	LIGHT INDICATES EXISTING
———	BOLD INDICATES NEW
GC	GRID CONNECT
GI	GRID INDEPENDENT

TABLE A - SEL547 RELAY
IEEE1547 / UL 1741SA GRID PROTECTION PARAMETER SETTINGS

THE REQUIRED GRID PROTECTION FUNCTIONS AND SETTINGS PER UL1741SA/IEEE1547 RESIDE IN THE INTERNAL SEL547 RELAY WITH SETTING NAMES AS SHOWN BELOW.

SETTING NAME	DESCRIPTION	GROUP 1 - "SUPPORT" 60 Hz SETTING 480Vac Tx RATIO 2.31 : 1	VOLTAGE P.U.	ANSI C37 DEVICE NUMBER
27P1P	UNDER VOLTAGE LEVEL 88%(V)	106	0.88	27
27P2P	MID UNDER VOLTAGE	106	0.88	
27P3P	UNDER VOLTAGE LEVEL 50% (V)	60	0.50	27
59P1P	OVER VOLTAGE LEVEL 110% (V)	132	1.1	59
59P2P	OVER VOLTAGE LEVEL 120% (V)	144	1.2	59
81D1P	FAST UNDER FREQUENCY LEVEL (Hz)	56.5		81U
81D2P	SLOW UNDER FREQUENCY LEVEL (Hz)	58.5		81U
81D3P	SLOW OVER FREQUENCY LEVEL (Hz)	61.2		81O
81D4P	FAST OVER FREQUENCY LEVEL (Hz)	62		81O
SV1PU	RECONNECTION TIME DELAY (CYCLES)	18,000		
SV2PU	FAST OVER FREQUENCY CLEARING TIME (CYCLES)	*5		
SV3PU	SLOW OVER FREQUENCY CLEARING TIME (CYCLES)	18,000		
SV4PU	FAST UNDERFREQUENCY CLEARING TIME (CYCLES)	18,000		
SV5PU	FAST UNDER FREQUENCY CLEARING TIME (CYCLES)	*5		
SV6PU	OVER VOLTAGE 120% CLEARING TIME (CYCLES)	*5		
SV7PU	OVER VOLTAGE 110% CLEARING TIME (CYCLES)	120		
SV8PU	UNDER VOLTAGE 88% CLEARING TIME (CYCLES)	120		
SV9PU	MID UNDER VOLTAGE 88% CLEARING TIME (CYCLES)	120		
SV10PU	UNDER VOLTAGE 50% CLEARING TIME (CYCLES)	66		
SV12PU	DELAY BETWEEN GRID OK STATUS AND BREAKER OPENING (CYCLES)	0		

★ NOTE 1: THE ACTUAL (TOTAL) PROTECTION CLEARING TIME EQUALS THE SUM OF THE PARAMETER CLEARING TIME SETTING IN THE TABLE PLUS 5 CYCLE BREAKER'S TRIPPING TIME. FOR EXAMPLE ACTUAL (TOTAL) FAST OVER CURRENT CLEARING TIME EQUALS PARAMETER SV6PU 5 CYCLES SETTING PLUS THE 5 CYCLE BREAKER CLEARING TIME FOR A TOTAL CLEARING TIME OF 10 CYCLES (0.16 SEC)

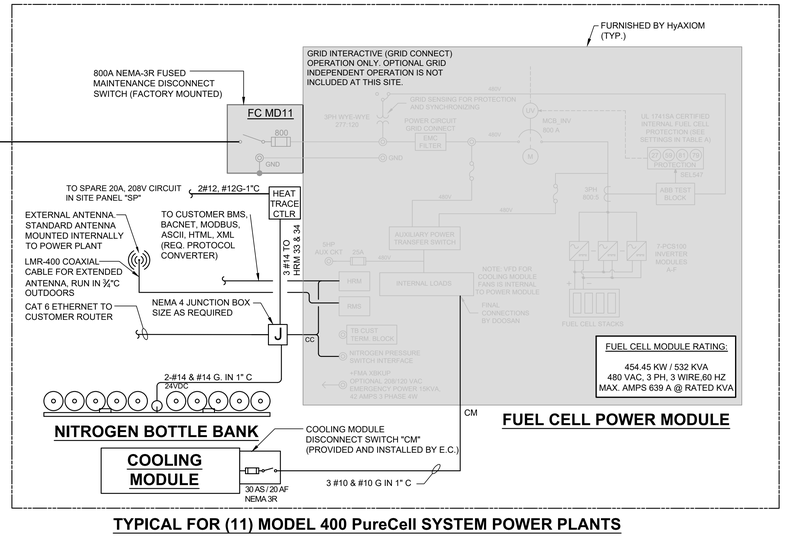
NOTE 2: GROUP 1 SETTINGS ARE FOR THE UL1741SA "GRID SUPPORT" AND GROUP 2 SETTINGS ARE FOR IEEE1547-2003 NON-SA SETTINGS - USE GROUP 1 FOR UL1741SA SITES.

NOTE 3: FOR DOOSAN ON-SITE PERSON - GROUP 1 OR GROUP 2 IS SET BY GROUP 9 PARAMETER "INVERTER MODE"

GROUP 1 = GRID SUPPORT (INVERTER MODE = 0 = FALSE) =UL1741SA

TABLE B - SEL451 RELAY

ANSI C37 DEVICE NUMBER	PROTECTION FUNCTION	MAGNITUDE	TIME
27	UNDER VOLTAGE	88%	2 SEC
27	FAST UNDER VOLTAGE	50%	66 CYCLES
59	OVER VOLTAGE	110%	2 SEC
59	FAST OVER VOLTAGE	120%	10 CYCLES
81	SLOW UNDER FREQUENCY	58.5 Hz	300 SECONDS
81	UNDER FREQUENCY	56.5 Hz	10 CYCLES
81	OVER FREQUENCY	62 Hz	10 CYCLES
81	SLOW OVER FREQUENCY	61.2 Hz	300 SECONDS
50P1P	INSTANTANEOUS OVERCURRENT	15 Inom (Inom = 250 A)	
50G	INSTANTANEOUS GROUND FAULT	1.0 Inom	
51S1P	TIME OVERCURRENT	1.4 x Inom (Inom = 250 A)	
51S1C	INVERSE TIME OVERCURRENT CURVE ELEMENT	18,000	U2 (INVERSE CURVE)
51S1TD	TIME OVERCURRENT DIAL ELEMENT	18.000	1



TYPICAL FOR (11) MODEL 400 PureCell SYSTEM POWER PLANTS

Rev.	Date	Description
C	06/21/24	UPDATED TO WYE-WYE TRANSFORMERS
B	05/30/24	UPDATED POWER PLANT RATING
A	05/29/24	ISSUED FOR CT SITING COUNCIL & UTILITY INTERCONNECTION

10 White Wood Lane
N. Branford, CT 06471
(203) 453-8596
info@icdsllc.com
ICDS
Innovative Construction & Design Solutions, LLC

STRATFORD SCEF
540 LONGBROOK AVE, STRATFORD CT
11 FUEL CELL INSTALLATION
4998.9 kW POWER PLANT
ELECTRICAL ONE-LINE DIAGRAM

Project No.:	Drawn By: KFH
Date: 05/29/24	Design By: DSF
Scale: AS NOTED	Check By: DSF

Drawing No.: E1.0

Attachment 3

Doosan Fuel Cell America, Inc.

Fuel Cell Fire Prevention and Emergency Response Guide

SCEF 5 Stratford

540 Long Brook Ave.

Stratford, CT 06614

DISCLAIMER

Doosan Fuel Cell America reserves the right to change or modify, without notice, the design or equipment specifications of the PureCell® system Model 400 without obligation with respect to equipment either previously sold or to be sold. This guide is provided by Doosan Fuel Cell America, and no liability will accrue to Doosan Fuel Cell America based on the information or specifications included herein. No warranties or representations are made by this guide and no warranties or representations shall apply to the equipment except as stated in Doosan Fuel Cell America's standard terms and conditions of sale applicable at the time of purchase, a copy of which will be provided upon request. The Model 400 is designed to provide safe and reliable service when operated within design specifications, according to all applicable instructions, and with the appropriate operating materials. When operating this equipment, use good judgment and follow safety precautions to avoid damage to equipment and property or injury to personnel. Be sure to understand and follow the procedures and safety precautions contained in all applicable instructions, Owner's Manual, operating materials, and those listed in this guide. All information in this document is as of February 28, 2019.

Policy

The following plan has been developed to minimize the severity of damage to human health, the environment, and property in the event of an unexpected failure.

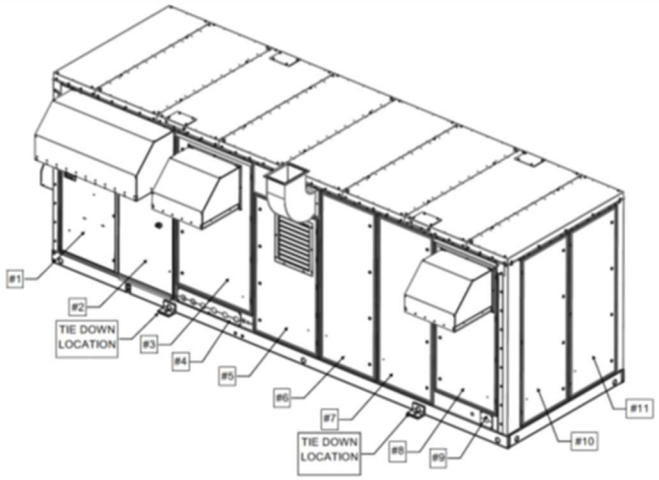
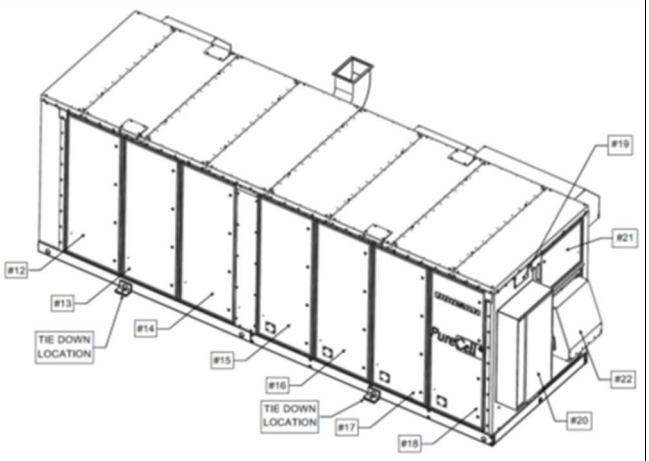
Scope

This Emergency Response Guide shall be integrated into the site Fire Prevention and Emergency Response Plan. Information contained in this document shall be customized to meet local requirements and shall be shared with local responders as necessary. This guide is only a template and in no way assumes or transfers liability or ownership. Doosan Fuel Cell America should be contacted if clarification is needed.

Emergency Contacts and Numbers

Local Emergency Number	**911**
Doosan Fuel Cell America Control Center	**(860) 727-2847**
Clean Harbors Emergency Cleanup Response	(800) 645-8265
Fire Department – Non-emergency number	Stratford Fire Department (203) 385-4070
Hospital – Non-emergency number	Bridgeport Hospital Milford Campus 300 Seaside Avenue Milford, CT 06460 203-876-4000
Electric Utility Name: United Illuminating Company	**203-929-1730**
Gas Utility Name: Connecticut Natural Gas/Southern Connecticut Gas	203-499-3417 *Gas Leaks Only: 800-513-8898
Local Oil & Chemical Spill Response Division	**800-645-8265**
EPA - Environmental Protection Agency	**(800) 424-8802** Environmental Emergency
OSHA - Occupational Safety and Health Admin. Emergency Number	**(800) 321-6742** National Emergency Number
Poison Control Center	**(800) 222-1222** National Emergency Number

Fuel Cell Hazard Overview

Front	Back
	

Rear View	Front View
	

480 V Grid Disconnect

Emergency Stop Button

Rear View Panel	Primary Hazard	Front View Panel	Primary Hazard
1 (Computer Terminal)	Electrical = 120 VAC	**12 (Reformer)**	Electrical = 480 VAC Chemical = Air sensitive catalyst / combustibles Thermal = 600°F Reformer Pressure = 150 psi steam
		13 (Reformer)	Electrical = 480 VAC Chemical = Air sensitive catalyst / combustibles Thermal = 600°F Reformer Pressure = 150 psi steam
2 (Swing Door)	Electrical = 480 VAC	**14 (Reformer)**	Electrical = 480 VAC Chemical = Air sensitive catalyst / combustibles Thermal = 600°F Reformer Pressure = 150 psi steam
3 (Mechanical Entry)	Electrical = 480 VAC Chemical = Propylene Glycol Thermal = 350°F Steam Pressure = 150 psi Steam	**15 (DC Cell Stack)**	Electrical = 300 VDC Chemical = Solid phosphoric acid / combustibles
4 (Mechanical Entry)	Chemical = Propylene Glycol Thermal = 350°F Steam Pressure = 150 psi Steam	**16 (DC Cell Stack)**	Electrical = 300 VDC Chemical = Solid phosphoric acid / combustibles
5 (TMS)	Electrical = 480 VAC Chemical = Propylene Glycol / Deionized Water / Resin Thermal = 350oF Steam Pressure = 150 psi Steam	**17 (DC Cell Stack)**	Electrical = 300 VDC Chemical = Solid phosphoric acid / combustibles
6 (ILS)	Electrical = 480 VAC Chemical = Air sensitive catalyst / combustibles Thermal = 600°F Reformer Pressure = 150 psi steam	**18 (DC Cell Stack)**	Electrical = 300 VDC Chemical = Solid phosphoric acid / combustibles
7 (Fuel Processing Area)	Electrical = 480 VAC Chemical = Air sensitive catalyst / combustibles Thermal = 600°F Reformer Pressure = 150 psi steam	**19**	Not accessible
8 (Fuel Processing Area)	Electrical = 480 VAC Chemical = Air sensitive catalyst / combustibles Thermal = 600°F Reformer Pressure = 150 psi steam	**20 (Grid Connect Disconnect)**	Electrical = 480 VAC
9 (Gas/Nitrogen Inlet)	Chemical = combustibles	**21 (Blower 110)**	Electrical = 300 VDC Mechanical = Blower
10 (Reformer)	Electrical = 480 VAC Chemical = Air sensitive catalyst / combustibles Thermal = 600°F Reformer Pressure = 150 psi steam	**22**	Electrical = 1400 VDC / 480 VAC
11 (Reformer)	Electrical = 480 VAC Chemical = Air sensitive catalyst / combustibles Thermal = 600°F Reformer Pressure = 150 psi steam	**ALL Roof Panels**	Multiple Hazards DO NOT WALK ON ROOF!

Conditional Assessment

Normal Condition	Potential Abnormal Condition	Response
Fuel Cell White steam exiting power plant at exhaust chimney, above panel #6 (It can be a large amount of white steam depending on ambient conditions)	Dark colored smoke exiting chimney or any other part of enclosure	1. Establish safe perimeter 2. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
	Observable fire or heavy smoke at any point on fuel cell	1. Press Fuel Cell 'Stop Button' – Only if safely accessible! 2. Dial 911 or Local Emergency Response Number 3. Establish safe perimeter 4. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
Fuel Cell Moderate humming, clicking and fan sounds	Grinding or loud intermittent noises	1. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
	Observable fire or heavy smoke at any point on fuel cell	1. Press Fuel Cell 'Stop Button' – Only if safely accessible! 2. Dial 911 or Local Emergency Response Number 3. Establish safe perimeter 4. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
Cooling Module Fan humming	Smoke or fire coming from module	1. Press Fuel Cell 'Stop Button' – Only if safely accessible! 2. Dial 911 or Local Emergency Response Number 3. Establish safe perimeter 4. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**

	Grinding or loud noise coming from fans	1. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
Cooling Module No leaking from cooling loop piping or coils	Small leak dripping from joint, valve or connection	1. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
	Medium to large leak	1. Follow local spill response protocol or contact Clean Harbors Emergency Cleanup Response **(800) 645-8265** 2. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
Mechanical Hi/Lo Grade Piping Small amounts of condensate dripping from piping	Small leak dripping from joint, valve or connection	1. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
	Medium to large leak	1. Follow local spill response protocol 2. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
Disconnects/Other Equipment No leaks or smoke	Smoke or fire coming from equipment	1. Dial 911 or Local Emergency Response Number 2. Establish safe perimeter 3. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**
Compressed Gas Manifold (N2/H2) No leaks, May hear intermittent gas flow during purges	Leaks – may be able to hear hissing sound.	1. **If Indoors – Evacuate Immediately!** Dial 911 or Local Emergency Response Number 2. Establish safe perimeter 3. Contact Doosan Fuel Cell America Control Center **(860) 727-2847**

Fuel Cell Related Safety Data Sheets (SDS)

1	Propylene Glycol – DowFrost®
2	Phosphoric Acid – Solid
3	Reformer/ILS Catalysts
4	Anion/Cation Resin
5	Nitrogen / Hydrogen Compressed Gas Mixture (non-flammable)

Inspections

Inspection Type	Equipment Requirements	Frequency Required
General Maintenance	Laptop, Service Vehicle	Monthly
General Housekeeping	N/A	Daily
Waste and Chemical Storage*	N/A	Weekly
Internal Combustible Gas Monitor	AT-160 Calibration Kit	Annual
Fire Prevention	N/A	Monthly

*When applicable

General Houskeeping: Combustible materials should not be stored near power plant. Keep combustible materials at least five feet away from power plant.

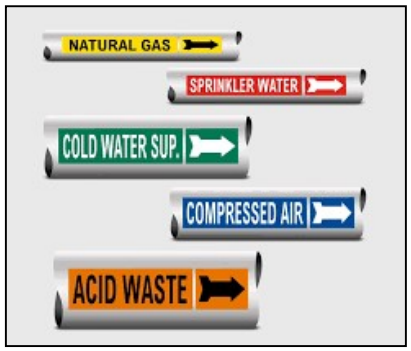
Fuel Cell operation is monitored and controlled remotely 24 hours a day 7 days a week by the Doosan Fuel Cell America Control Center. Upset or abnormal occurrences outside of normal operating parameters are immediately identified and service technicians are dispatched within 24 hours to respond when required.

Emergency Procedures

Alarms	There are no audible or visual alarms on Fuel Cell. Alarm conditions are relayed immediately to the Doosan Fuel Cell America Control Center. The Doosan Fuel Cell America Control Center will then contact the appropriate site personnel on the site's emergency contact list.
Emergency Shut Down Onsite	Actuate Fuel Cell Stop Button
Emergency Area Egress - Gas Odor	Evacuate 330 Feet in all directions
Emergency Area Egress - Fire	Evacuate employees and visitors no directly involved in fire-fighting activities 330 Feet in all directions – Notify fire response personnel. Coordinate with security forces or other designated personnel to admit pulic fire department and control traffic and personnel. There are no restrictions for type of fire suppression equipment. CV000 automatic natural gas supply shut off will engage through tripping of power plant thermal fuses

	or by depressing the Fast Stop button. No further power plant interaction is required. If necessary, a Fire Report should be filed, investigation conducted and corrective actions identified.
Emergency Egress - General	Fuel cell is unmanned remotely monitored and controlled. No Doosan Fuel Cell America employees attending unit unless service or maintenance is required.

Signage and labeling



General:

Safety Hazard Analysis

The PureCell® Model 400 fuel cell system has been designed to meet strict ANSI/CSA safety standards to protect against risks from electrical, mechanical, chemical, and combustion safety hazards. The following items are a few of the safety measures incorporated into the design.

Fire Detection and Protection:

The power plant design incorporates a combustible gas sensor as well as thermal fuses located throughout the power module cabinet to detect fire. The detection of a potential flammable gas mixture, a fire, or the failure of this detection circuit will result in a power plant shutdown and a subsequent inert gas (nitrogen) purge of the fuel cell stack and fuel processing system. This event will also result in an alarm callout notification to Doosan Fuel Cell America service personnel.

The power plant is designed with an integral emergency-stop button on the outside of the enclosure to enable immediate shutdown in the event of an emergency. There is also a gas shut-off valve and electrical disconnect switch easily accessible to emergency personnel. There are no restrictions for type of fire suppression equipment.

Gas Leak:

Augmenting the internal combustible gas sensor, the power plant also monitors the flow rate of natural gas. If the gas flow rate exceeds the equivalent power production of the power plant then a shutdown will result. The largest possible accumulation from a leak prior to shutdown is below combustible limits. Fuel valves inside the power plant are “fail safe” and will return to their normally closed position upon loss of power. The power plant is designed to have a physical barrier that separates the equipment handling combustible gases (fuel compartment) from electrical or potential spark-creating equipment (motor compartment). The fuel compartment is kept at a negative pressure to contain and remove any potential gas leaks, whereas the motor compartment is pressurized by a fan source to prevent combustible gases from entering.

Hydrogen:

Hydrogen is lighter than air and thus does not pool like other fuels and will readily dissipate with proper ventilation making it less likely to ignite. Although hydrogen has low self-ignition characteristics, the fuel in the power plant is not pure hydrogen. Also, the power plant is not producing or storing hydrogen, it consumes hydrogen-rich gas equal to what it requires to produce power. The fuel cell stack is wrapped in a fire retardant blanket. There are no materials inside the unit that would sustain a flame. There is no large volume of gas or any ignition that occurs within the cell stack.

Phosphoric Acid:

Phosphoric acid is integral part of the fuel cell system, acting as the electrolyte within the fuel cell stack. Phosphoric acid is a surprisingly common substance that is contained in common cola drinks. A leak of phosphoric acid is not possible because phosphoric acid is not in liquid form once applied in the equipment. There is no reservoir of liquid. Phosphoric acid is contained in the porous structure of the fuel cell stack material by capillary action, similar to how ink is absorbed into a blotter.

Fluid Leak:

All pressurized water vessels are designed to ASME boiler codes and inspected annually. All piping, welds, etc. meet pressurized piping standards. There are three fluid sources inside the fuel cell power module:

1) Water produced through the electrochemical process is “pure” water and is reclaimed and reused by the process.
2) Fluid used in the external cooling module, which is water mixed with a polypropylene glycol and a rust inhibitor to prevent rust and freezing in colder climates.
3) Fluid used in the heat recovery loops, this is the same glycol solution used in the external cooling module.

If a leak is observed around the fuel cell power module or absorption use a gray or blue absorbent mat, pad, or boom to contain the leak and prevent it from entering any drains. Contact Doosan Fuel Cell America, Inc Control Center for further assistance in identifying the leak source.

Hazardous Waste:

The fuel cell does not produce any hazardous waste. Standard Material Safety Data Sheets (MSDS) are available upon request.

APPENDIX A — FUEL CELL AND ANCILLARY EQUIPMENT DAILY CHECKLIST

⚠ CAUTION

This checklist has been developed as a guide. It is not intended to provide a comprehensive list of all possible hazards or risks. At no time are you authorized to open or manipulate any equipment, including but not limited to the fuel cell, cooling module, or liquid chiller.

If you observe an EMERGENCY, use your local emergency notification protocol and then notify Doosan Control Center at (860) 727-2847.

Month: _____	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*
General Housekeeping																															
1.Safe access is provided to/from fuel cell location (snow and ice removed - 48" parameter around fuel cell and 48" wide cleared access, lighted access, etc.)																															
2. No construction or other hazards/risks exist																															
3. Access gate is locked/secured (site specific)																															
4. No combustible material within 60” of PPLT																															
Fuel Cell																															
1. Doors are closed and appear secured																															
2. Fuel cell appears to be operating as normal																															
a. No leaks																															
b. No smoke or burning smell (if the fuel cell is running, steam will come out of chimney - this is normal)																															
4. No strong natural gas (mercaptan) smell is observed																															
5. No leaks or discharges are coming from mechanical piping to/from fuel cell																															

APPENDIX 1 – SAFETY DATA SHEETS

SAFETY DATA SHEET

1. Identification

Product identifier: PHOSPHORIC ACID

Other means of identification

Synonyms: Ortho-Phosphoric Acid, White Phosphoric Acid

Product No.: 0240, 6908, 2798, 2797, 5854, 2796, 5804, 2788, 0259, 5372, 0274, 0269, 0268, 0265, 0264, 0262, 0260, 0255, 0251

Recommended use and restriction on use

Recommended use: Not available.

Restrictions on use: Not known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company Name:	Avantor Performance Materials, Inc.
Address:	3477 Corporate Parkway, Suite 200 Center Valley, PA 18034
Telephone:	Customer Service: 855-282-6867
Fax:	
Contact Person:	Environmental Health & Safety
e-mail:	info@avantormaterials.com

Emergency telephone number:

24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

2. Hazard(s) identification

Hazard classification

Physical hazards

Corrosive to metals	Category 1

Health hazards

Acute toxicity (Oral)	Category 4
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity - single exposure	Category 3

Unknown toxicity

Acute toxicity, oral	0 %
Acute toxicity, dermal	0 %
Acute toxicity, inhalation, vapor	100 %
Acute toxicity, inhalation, dust or mist	100 %

Unknown toxicity

Acute hazards to the aquatic environment	84 %
Chronic hazards to the aquatic environment	84 %

Label elements

Hazard symbol:

Signal word: Danger

Hazard statement: May be corrosive to metals.
Harmful if swallowed.
Causes severe skin burns and eye damage.
May cause respiratory irritation.

Precautionary statement

Prevention: Keep only in original container. Do not breathe dust/fume/mist/vapors. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling.

Response: Absorb spillage to prevent material damage. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

Storage: Store locked up. Store in a well-ventilated place. Keep container tightly closed. Store in corrosive resistant container with a resistant inner liner.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: None.

3. Composition/information on ingredients

Mixtures

Chemical identity	Common name and synonyms	CAS number	Content in percent (%)*
PHOSPHORIC ACID		7664-38-2	80 - 90%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information: Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

Ingestion:	Do NOT induce vomiting. Call a physician or poison control center immediately. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Inhalation:	Move to fresh air. Call a physician or poison control center immediately. Apply artificial respiration if victim is not breathing If breathing is difficult, give oxygen.
Skin contact:	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
Eye contact:	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.

Most important symptoms/effects, acute and delayed

Symptoms:	Causes severe skin and eye burns. Causes digestive tract burns.

Indication of immediate medical attention and special treatment needed

Treatment:	Treat symptomatically. Symptoms may be delayed.

5. Fire-fighting measures

General fire hazards:	No data available.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:	The product is non-combustible. Use fire-extinguishing media appropriate for surrounding materials.
Unsuitable extinguishing media:	None known.
Specific hazards arising from the chemical:	Not combustible, but if involved in a fire decomposes to produce toxic gases.

Special protective equipment and precautions for firefighters

Special fire fighting procedures:	Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters:	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Product is highly acidic. Wear protective gear if spilled during fire fighting.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	See Section 8 of the MSDS for Personal Protective Equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep unauthorized personnel away. Keep upwind. Ventilate closed spaces before entering them.

Methods and material for containment and cleaning up:	Neutralize with lime or soda ash. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.
Notification Procedures:	Inform authorities if large amounts are involved.
Environmental precautions:	Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so.

7. Handling and storage

Precautions for safe handling:	Do not get in eyes, on skin, on clothing. Do not taste or swallow. Wash thoroughly after handling. Do not eat, drink or smoke when using the product. Use caution when adding this material to water. Add material slowly when mixing with water. Do not add water to the material; instead, add the material to the water.
Conditions for safe storage, including any incompatibilities:	Do not store in metal containers. Keep container tightly closed. Store in a well-ventilated place.

8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Chemical identity	Type	Exposure Limit values	Source
PHOSPHORIC ACID	TWA	1 mg/m3	US. ACGIH Threshold Limit Values (2011)
	STEL	3 mg/m3	US. ACGIH Threshold Limit Values (2011)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	1 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	1 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	STEL	3 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	1 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
	STEL	3 mg/m3	US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A (06 2008)
	ST ESL	10 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	AN ESL	1 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (12 2010)
	TWA PEL	1 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)
	STEL	3 mg/m3	US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants (08 2010)

Appropriate engineering controls	No data available.

Individual protection measures, such as personal protective equipment

General information:	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area.
Eye/face protection:	Wear safety glasses with side shields (or goggles) and a face shield.
Skin protection	
Hand protection:	Chemical resistant gloves
Other:	Wear suitable protective clothing and gloves.
Respiratory protection:	In case of inadequate ventilation use suitable respirator. Respirator type: Chemical respirator with acid gas cartridge.
Hygiene measures:	Provide eyewash station and safety shower. Observe good industrial hygiene practices. Wash hands before breaks and immediately after handling the product. Wash contaminated clothing before reuse. Avoid contact with eyes. Avoid contact with skin.

9. Physical and chemical properties

Appearance	
Physical state:	Liquid
Form:	Liquid
Color:	Colorless
Odor:	Odorless
Odor threshold:	No data available.
pH:	1.5 0.1 N Aqueous solution
Melting point/freezing point:	21.1 °C
Initial boiling point and boiling range:	158 °C
Flash Point:	Not applicable
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	No data available.
Flammability limit - lower (%):	No data available.
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	0.3 kPa
Vapor density:	No data available.
Relative density:	1.69 (20 °C)
Solubility(ies)	
Solubility in water:	Miscible with water.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. Stability and reactivity

Reactivity:	No dangerous reaction known under conditions of normal use.
Chemical stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	Hazardous polymerization does not occur.
Conditions to avoid:	Avoid contact with oxidizing agents. Avoid contact with strong reducing agents. Contact with alkalis.
Incompatible materials:	Strong reducing agents. Alkalies. Strong oxidizing agents. Metals.
Hazardous decomposition products:	oxides of phosphorus

11. Toxicological information

Information on likely routes of exposure

Ingestion:	Harmful if swallowed.
Inhalation:	Severely irritating to respiratory system.
Skin contact:	Causes severe skin burns.
Eye contact:	Causes serious eye damage.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: ATEmix (Rat): 1,700 mg/kg

Dermal
Product: ATEmix (): 3,044.44 mg/kg

Inhalation
Product: No data available.

Repeated dose toxicity
Product: No data available.

Skin corrosion/irritation
Product: Causes severe skin burns.

Serious eye damage/eye irritation
Product: Causes serious eye damage.

Respiratory or skin sensitization
Product: Not a skin sensitizer.

Carcinogenicity
Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:
No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):
No carcinogenic components identified

Germ cell mutagenicity

In vitro
Product: No mutagenic components identified

In vivo
Product: No mutagenic components identified

Reproductive toxicity
Product: No components toxic to reproduction

Specific target organ toxicity - single exposure
Product: None known.

Specific target organ toxicity - repeated exposure
Product: None known.

Aspiration hazard
Product: Not classified

Other effects: Not known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic invertebrates
Product: No data available.

Chronic hazards to the aquatic environment:

Fish
Product: No data available.

Aquatic invertebrates
Product: No data available.

Toxicity to Aquatic Plants
Product: No data available.

Persistence and degradability

Biodegradation
Product: Expected to be readily biodegradable.

BOD/COD ratio
Product: No data available.

Bioaccumulative potential
Bioconcentration factor (BCF)
Product: No data available on bioaccumulation.

Partition coefficient n-octanol / water (log Kow)
Product: No data available.

Mobility in soil: The product is water soluble and may spread in water systems.

Other adverse effects: The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws.

Contaminated packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number:	UN 1805
UN proper shipping name:	Phosphoric acid solution
Transport hazard class(es)	
Class(es):	8
Label(s):	8
Packing group:	III
Marine Pollutant:	No

IMDG

UN number:	UN 1805
UN proper shipping name:	PHOSPHORIC ACID SOLUTION
Transport hazard class(es)	
Class(es):	8
Label(s):	8
EmS No.:	F-A, S-B
Packing group:	III
Marine Pollutant:	No

IATA

UN number:	UN 1805
Proper Shipping Name:	Phosphoric acid, solution
Transport hazard class(es):	
Class(es):	8
Label(s):	8
Marine Pollutant:	No
Packing group:	III

15. Regulatory information

US federal regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

PHOSPHORIC ACID Reportable quantity: 5000 lbs.

Superfund amendments and reauthorization act of 1986 (SARA)

Hazard categories

[X] Acute (Immediate) [X] Chronic (Delayed) [ ] Fire [ ] Reactive [ ] Pressure Generating

SARA 302 Extremely hazardous substance
None present or none present in regulated quantities.

SARA 304 Emergency release notification

Chemical identity	RQ
PHOSPHORIC ACID	5000 lbs.

SARA 311/312 Hazardous chemical

Chemical identity	Threshold Planning Quantity
PHOSPHORIC ACID	500 lbs

SARA 313 (TRI reporting)
None present or none present in regulated quantities.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)
PHOSPHORIC ACID Reportable quantity: 5000 lbs.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
None present or none present in regulated quantities.

US state regulations

US. California Proposition 65
No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act
PHOSPHORIC ACID Listed

US. Massachusetts RTK - Substance List
PHOSPHORIC ACID Listed

US. Pennsylvania RTK - Hazardous Substances
PHOSPHORIC ACID Listed

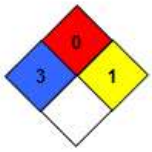
US. Rhode Island RTK
PHOSPHORIC ACID Listed

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EINECS, ELINCS or NLP:	On or in compliance with the inventory
Japan (ENCS) List:	On or in compliance with the inventory
China Inv. Existing Chemical Substances:	Not in compliance with the inventory.
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Japan ISHL Listing:	Not in compliance with the inventory.
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

16.Other information, including date of preparation or last revision

NFPA Hazard ID



Flammability
Health
Reactivity
Special hazard.

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

Issue date:	04-07-2014
Revision date:	No data available.
Version #:	1.0
Further information:	No data available.
Disclaimer:	THE INFORMATION PRESENTED IN THIS MATERIAL SAFETY DATA SHEET (MSDS/SDS) WAS PREPARED BY TECHNICAL PERSONNEL BASED ON DATA THAT THEY BELIEVE IN THEIR GOOD FAITH JUDGMENT IS ACCURATE. HOWEVER, THE INFORMATION PROVIDED HEREIN IS PROVIDED "AS IS," AND AVANTOR PERFORMANCE MATERIALS MAKES AND GIVES NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, AND EXPRESSLY DISCLAIMS ALL WARRANTIES REGARDING SUCH INFORMATION AND THE PRODUCT TO WHICH IT RELATES, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING WITHOUT LIMITATION, WARRANTIES OF ACCURACY, COMPLETENESS, MERCHANTABILITY, NON-INFRINGEMENT, PERFORMANCE, SAFETY, SUITABILITY, STABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES ARISING FROM COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE. THIS MSDS/SDS IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE MATERIAL BY A PROPERLY TRAINED PERSON USING THIS PRODUCT, AND IS NOT INTENDED TO BE COMPREHENSIVE AS TO THE MANNER AND CONDITIONS OF USE, HANDLING, STORAGE, OR DISPOSAL OF THE PRODUCT. INDIVIDUALS RECEIVING THIS MSDS/SDS MUST ALWAYS EXERCISE THEIR OWN INDEPENDENT JUDGMENT IN DETERMINING THE APPROPRIATENESS OF SUCH ISSUES. ACCORDINGLY, AVANTOR PERFORMANCE MATERIALS ASSUMES NO LIABILITY WHATSOEVER FOR THE USE OF OR RELIANCE UPON THIS INFORMATION. NO SUGGESTIONS FOR USE ARE INTENDED AS, AND NOTHING HEREIN SHALL BE CONSTRUED AS, A RECOMMENDATION TO INFRINGE ANY EXISTING PATENTS OR TO VIOLATE ANY FEDERAL, STATE, LOCAL, OR FOREIGN LAWS. AVANTOR PERFORMANCE MATERIALS REMINDS YOU THAT IT IS YOUR LEGAL DUTY TO MAKE ALL INFORMATION IN THIS MSDS/SDS AVAILABLE TO YOUR EMPLOYEES.

NN53

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Shift Max 230, Reduced Heterogeneous Catalyst, FC72372

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Doosan Fuel Cell America, Inc.
195 Governors Hwy.
South Windsor, CT 06074
USA

TELEPHONE: 24 HOUR EMERGENCY: 1-800-424-9300 (CHEMTREC)
PRODUCT INFORMATION: 860-727-2200

MSDS NO: NN53 INITIAL RELEASE DATE: 4/23/2009 REVISION DATE:

GENERIC DESCRIPTION: Reduced catalyst
PHYSICAL FORM: Cylindrical tablets
COLOR: Dark brown
ODOR: None
NFPA 704 CODES: HEALTH: 1 FLAMMABILITY: 4 REACTIVITY: 2

NOTE: NFPA = NATIONAL FIRE PROTECTION ASSOCIATION

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

CAS NUMBER	%WT/VOL.	COMPONENTS	EXPOSURE LIMITS OSHA	EXPOSURE LIMITS ACGIH
The following is the composition of the packed tablets:				
1344-28-1	9-12	Aluminum oxide	15 mg/m3 5 mg/m3 (respirable)	1 mg/m^3 (respirable)
7440-50-8	55-62	Copper	1 mg/m3	1 mg/m^3 (dust)
1314-13-2	28-33	Zinc oxide	15 mg/m3 5 mg/m3 (respirable)	2 mg/m^3 (respirable)

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Shift Max 230, Reduced Heterogeneous Catalyst, FC72372

SECTION 3. EFFECTS OF OVEREXPOSURE

ACUTE EFFECTS:

EYE:	May cause irritation
SKIN:	Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
INHALATION:	Prolonged or repeated inhalation may cause lung damage. Prolonged or excessive inhalation may cause respiratory tract irritation.
ORAL:	Moderately toxic and may be harmful if swallowed; may damage the liver, pancreas, kidney or nervous systems.

REPEATED EXPOSURE EFFECTS:

EYE:	Signs and symptoms of overexposure may include scratch or abrasion, damage to cornea (necrosis).
SKIN:	Overexposure may cause skin rash, dermatitis and or itching.
INHALATION:	Overexposure may cause coughing, wheezing, shortness of breath, difficult breathing, chest pain.
ORAL:	Ingestion may cause upset stomach and intestinal distress.

SECTION 3. EFFECTS OF OVEREXPOSURE

NOTE TO PHYSICIANS: N/D

THIS MATERIAL CONTAINS THE FOLLOWING COMPONENTS WITH THE SPECIAL HAZARDS LISTED BELOW.

CARCINOGENS	N/A
TERATOGENS	N/A
MUTAGENS	N/A
REPRODUCTIVE TOXINS	N/A
SENSITIZERS	N/A
COMMENTS:	None
NTP CLASSIFICATION:	N/A
IARC CLASSIFICATION:	N/A
OSHA CLASSIFICATION:	N/A

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Shift Max 230, Reduced Heterogeneous Catalyst, FC72372

SECTION 4. FIRST AID MEASURES

EYE:	**Immediately flush eyes with plenty of water for at least 30 minutes. Get immediate medical attention.**
SKIN:	**Wash with plenty of soap and water. Get medical attention if irritation develops or persists.**
INHALATION:	**Remove to fresh air. If breathing is difficult seek immediate medical attention.**
ORAL:	**If swallowed, do NOT induce vomiting. Give victim large quantities of water. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.**
COMMENTS:	**Exposure to fumes of the metal oxides may cause metal fume fever including irritation of eyes and respiratory tract and flu-like symptoms.**

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT (METHOD):	N/A
AUTOIGNITION TEMPERATURE:	N/A
FLAMMABILITY LIMITS IN AIR:	N/A
EXTINGUISHING MEDIA:	Protect exposures; cool with water fog. For small fires use Class D extinguishing media.
UNSUITABLE EXTINGUISHING MEDIA:	N/D
FIRE FIGHTING PROCEDURES:	Wear full protective clothing and SCBA's.
UNUSUAL FIRE HAZARDS:	Packed material will spontaneously oxidize in air, producing significant heat. Keep away from combustible materials.
HAZARDOUS DECOMPOSITION PRODUCTS:	Toxic metal fumes may be emitted if thermally decomposed.

SECTION 6. ACCIDENTAL RELEASE MEASURES

CONTAINMENT / CLEAN UP:

Small spill	With shovel or scoop, place material onto clean, dry non-flammable surface to allow catalyst to oxidize. Place oxidized catalyst into container and cover loosely. Remove containers from spill area. Protect against inhalation of dusts or fumes, Wear eye protection.
Large spill	Wet methods of cleanup are preferred. Keep airborne particulates to a minimum. Protect against inhalation of dusts or fumes, Wear eye protection. Place in appropriate containers for disposal.

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Shift Max 230, Reduced Heterogeneous Catalyst, FC72372

SECTION 7. HANDLING AND STORAGE

HANDLING: No special precautions for intact containers.

STORAGE: Store in dry area. Prevent exposure to air by maintaining under an inert gas atmosphere such as nitrogen. Use additional precautions to prevent asphyxiant hazards due to inert gas usage.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

LOCAL EXHAUST: If user operations generate dust or fume, use ventilation to keep exposure to airborne contaminates below the exposure limits.

GENERAL VENTILATION: N/A

PERSONAL PROTECTIVE EQUIPMENT FOR ROUTINE HANDLING

EYES: Wear safety glasses with side shields or goggles.

SKIN: Wear protective clothing, including long sleeves and gloves to prevent skin contact.

SUITABLE GLOVES: Impermeable, such as latex, Nitrile, etc.

INHALATION: Wear NIOSH approved respirator with particulate filter.

PERSONAL PROTECTIVE EQUIPMENT FOR SPILLS

EYES: Chemical goggles

SKIN: Chemical resistant gloves

INHALATION / SUITABLE RESPIRATOR: (Min) Use NIOSH-approved respirator with particulate filter

PRECAUTIONARY MEASURES: N/D

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Shift Max 230, Reduced Heterogeneous Catalyst, FC72372

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

TYPICAL PHYSICAL PROPERTIES ARE GIVEN BELOW.

APPEARANCE: Cylindrical tablets
COLOR: Dark brown
ODOR: None
ODOR THRESHOLD: N/A
pH: N/A
BOILING POINT C (F): N/A
MELTING POINT C (F): N/A
SOLUBILITY IN WATER: Insoluble
VISCOSITY AT_____: N/A
VISCOSITY AT_____:
RELATIVE DENSITY TO: 65-85 lb./CF (bulk)

POUR POINT C (F): N/A
FREEZING POINT C (F): N/A
VOLATILE ORGANIC COMPOUND:
SPECIFIC GRAVITY: (H_2O = 1) >8
VAPOR PRESSURE - mmHg: N/A
VAPOR DENSITY @ TEMP:_____: N/A
EVAPORATION RATE RELATIVE TO_____: N/A
EXPLOSIVE PROPERTIES: Will not explode
OXIDIZING PROPERTIES: Not an oxidizer

SECTION 10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Generally considered stable when contained under an inert atmosphere.

CONDITIONS TO AVOID: Exposure to air.

INCOMPATIBILITY (MATERIALS TO AVOID): Combustible materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce metal oxide fumes.

HAZARDOUS POLYMERIZATION: Not expected to occur.

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Shift Max 230, Reduced Heterogeneous Catalyst, FC72372

SECTION 11. TOXICOLOGICAL DATA

Exposure to metal oxide fume may produce "metal fume fever" which is characterized by flu-like symptoms including fever, chills and general aches.

SECTION 12. ECOLOGICAL INFORMATION

No data available.

SECTION 13. DISPOSAL CONSIDERATIONS

Local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state and local environmental control regulations.

SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME: Self-heating solid, inorganic, N.O.S.

HAZARD TECHNICAL NAME: Reduced copper catalysts.

HAZARD CLASS: 4.2

UN NUMBER: 3190

PACKING GROUP: II

SECTION 15. REGULATORY INFORMATION

TSCA STATUS: Component materials are in the TSCA inventory.

EPA SARA TITLE III CHEMICAL LISTINGS:

SECTION 302 HAZARDOUS SUBSTANCES: No

SECTION 355 EXTREMELY HAZARDOUS SUBSTANCES: No

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Shift Max 230, Reduced Heterogeneous Catalyst, FC72372

SECTION 15. REGULATORY INFORMATION, CONTINUED

SECTION 312 HAZARD CLASS:

ACUTE:	Yes
CHRONIC:	Yes
FIRE:	Yes
PRESSURE:	No
REACTIVE:	No

SECTION 372 TOXIC CHEMICALS: Copper.

SECTION 16. OTHER INFORMATION

COMMENTS: N/D = Not Determined
N/A = Not Applicable

As a unit, the materials do not pose a hazard. However, should the container be compromised and the packed catalyst become available, measures must be taken to prevent exposure to air.

PREPARED BY: D. Black, J. Preston
Revision By:

DATE: 4/23/2009

INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING LICENSE UNDER VALID PATENTS. APPROPRIATE WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS.

Attachment 4

Prepared For: **HiAxiom, Inc.**

Point of Contact: **Walter Bonola**

Prepared by: **Acoustical Technologies Inc.**
50 Myrock Avenue
Waterford, CT 06385-3008

Subject: **Eleven Fuel Cells**
Airborne Noise Assessment
At 540 Longbrook Avenue
Stratford, CT 06614

Author: **Carl Cascio**

Date: **June 4, 2024**

Revision: **0**

Table of Contents

Summary

This document makes a positive acoustic assessment that should assist in meeting any acoustic noise concerns during the operation of eleven HiAxiom 460 KW fuel cells at the site at 540 Longbrook Avenue in Stratford, CT. An acoustic assessment plan was developed and executed to acquire airborne acoustic information useful in explaining and mitigating any potential airborne noise issues during operation of the eleven 460 KW fuel cells. It is important to show that the airborne noise generated by the fuel cells will not significantly impact the facility's neighbors.

The airborne noise levels expected to be generated by the HiAxiom fuel cells operating at the Stratford site were simulated by exciting a Soundboks speaker at two of the fuel cell Cooling Module positions. (The Cooling Module is the dominant noise source.) The Soundboks speaker produced an overall airborne noise level that was 25 dB higher than the levels measured for a single HiAxiom fuel cell installed at Montville, CT. One-third octave band analysis showed the speakers' level to be near the Montville fuel cell airborne noise levels at low frequencies where the airborne noise levels were low and to exceed the fuel cell signature by 25 dB at higher frequencies where the Montville fuel cell signature was higher in noise level.

Airborne noise levels with the speakers operating were measured at distances from 5 to 137 meters from the proposed fuel cell location on Longbrook Avenue. The speaker produced overall A-weighted sound pressure levels of approximately 98 dBA at 5 meters and roughly 91 to 92 dBA at 10 meters (reference 20 microPascals) at the proposed fuel cell locations. The airborne noise levels from the speakers as received at nearby properties on site were measured at noise levels of 50 to 76 dBA. Residential measurement locations to the west were just above background but still able to record the airborne noise with the speaker on. Analysis of the speaker data indicated propagation losses of at least 14 to 45 dB from the fuel cells' location to the nearby properties. The source level at 10 meters from the operation of a HiAxiom fuel cell at Montville, CT was then used as a basis for making the Stratford fuel cell airborne noise estimates with eleven units operating.

Operation of the eleven HiAxiom fuel cells will have no significant acoustic impact at all of the nearby properties adjacent to the HiAxiom fuel cell site on Longbrook Avenue. All the residences should be more than 8 dB below the night time noise requirement[1] while all the commercial properties should be more than 4 dB below the commercial requirement[2].

The Connecticut's Noise Code (Reference 1) also calls for review of acoustic issues associated with impulse noise, prominent discrete tones, infrasonic and ultrasonic noise. Operation of the fuel cells is expected to meet all of these requirements at all of the nearby property lines.

Introduction

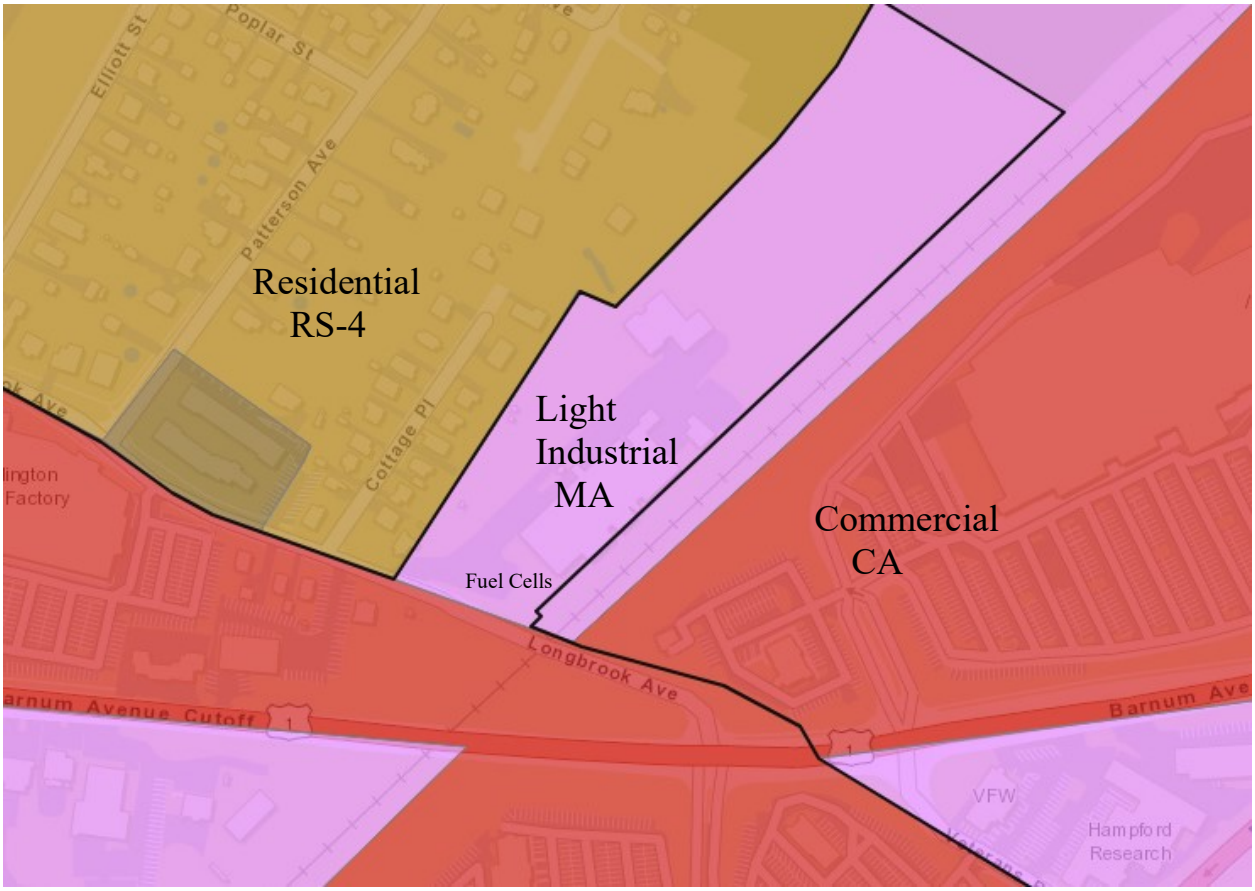
Acoustical Technologies Inc. was tasked as part of a HiAxiom site permitting process with an assessment of potential acoustic issues associated with fuel cell airborne noise reaching the properties adjacent to the proposed site at 540 Longbrook Avenue in Stratford, CT. Responding to a request from Walter Bonola, a site visit was made on May 28, 2024. During the visit, a survey of the airborne noise levels produced by a Soundboks speaker simulating the airborne noise produced by a HiAxiom Fuel Cell was made in order to identify potential airborne noise issues. Airborne noise measurements were taken to quantify the propagation of the simulated fuel cell airborne noise to the adjacent properties. Background airborne noise levels were also made with the speaker off. This document provides an acoustic assessment to assist in meeting acoustic noise concerns during the permitting process for the siting of eleven HiAxiom fuel cells at the 540 Longbrook Avenue site.

Development of the Acoustic Assessment Plan

The purpose of this effort is to acquire acoustic information useful in explaining the potential airborne noise issues associated with the operation of eleven HiAxiom 460 KW fuel cells at the site on Longbrook Avenue. The proposed site at 540 Longbrook Avenue is located in a Light Industrial (MA) Zone. This Industrial Zone is surrounded by a Residential RS-4 zone to the west and Commercial (CA) Zones to the north, east and south. Figure 1 shows a section of the Stratford zoning map where the site is located. It is important to determine whether the airborne noise generated by the eleven HiAxiom fuel cells will impact these neighbors.

The acoustic impact is assessed in the following way. The fuel cells are yet to be installed so there is no way to measure fuel cell operating airborne noise levels at the new site. The fuel cell airborne noise has been measured at other sites and both overall and one-third octave band airborne noise data of a typical HiAxiom 460 KW fuel cell are available (Reference 3). Using this data, a Soundboks speaker has been programmed through a set of filters to generate a noise spectrum similar to that of the 460 KW fuel cell. (It is assumed that the Cooling and Power Module noise in the existing measured 460 KW fuel cell are similar to the new units.) This spectrum will then be played through an audio amplifier to create the electrical voltage necessary to drive the Soundboks speaker. In order to overcome the potentially high background noise at the Stratford site the speaker output will be increased to a level more than 25 dB higher than the overall dBA noise level measured on a 460 KW fuel cell at a distance of 10 meters. With the speaker on, this approach then follows the traditional “What is the airborne noise level at the neighbor’s property line?”. The speaker will be run and airborne measurements made near the proposed fuel cell locations and at several of the nearest neighbor’s properties. This measured site data can also be used to estimate noise levels at other neighbor’s property lines. The State of Connecticut’s Noise Ordinance[1] and the Town of Stratford Noise Ordinance[2] will then be consulted to assess the impact of the measured and estimated acoustic levels. Because of the closeness of the proposed fuel cell site to the nearest properties noise mitigation may be recommended if the airborne noise estimated for eleven fuel cells comes near or exceeds the noise requirements at the neighbors’ property lines.

Figure 1. Part of the Stratford Zoning Map Showing the Area near the Eleven Fuel Cells



Acoustic Measurement Program

The acoustic data necessary to assess the impact of eleven 460 KW HiAxiom Fuel Cells are described below: Airborne sound pressure measurements were conducted at the 540 Longbrook Avenue site on May 28, 2024 during the midday hours. This testing established both background airborne noise levels and simulated airborne noise levels with the speaker operating. The overall A-weighted airborne noise measurements were made with an ExTech model 407780A Digital Sound Level Meter (s/n 140401544) that had been calibrated prior to and just after the test with a Quest model QC-10 Calibrator (s/n Q19080194). Measurements were taken with A-weighting (frequency filtering that corresponds to human hearing) and with the sound level meter in a Slow response mode. For reference, a noise level increase of 1 dB is equal to an airborne sound pressure increase of 12.2 per cent. All measurements were made with the microphone at a height above ground between five and six feet. The sound pressure data reported herein are all given in dB reference 20 microPascals.

In Stratford “speaker on” and background airborne noise measurements were taken at 5 and 10 meters from the proposed 460 KW fuel cell site and at the following nine nearby properties.

Location	Business	Distance	Zone	Type
1 – Fuel Cell West Side	HiAxiom	5 meters	MA	Light Industrial
2 – Fuel Cell West Side	HiAxiom	10 meters	MA	Light Industrial
3 – Fuel Cell East Side	HiAxiom	5 meters	MA	Light Industrial
4 – Fuel Cell East Side	HiAxiom	10 meters	MA	Light Industrial
P1 – 586 Longbrook Avenue	Home	78 meters	RS-4	Residential
P2– 26 Cottage Place	Home	89 meters	RS-4	Residential
P3 – 36 Cottage Place	Home	83 meters	RS-4	Residential
P4 – 44 Cottage Place	Home	81 meters	RS-4	Residential
P5 – 66 Cottage Place	Home	81 meters	RS-4	Residential
P6 – 585 Longbrook Avenue	Home	94 meters	CA	Commercial
P7 – A Longbrook Avenue	Empty Lot	70 meters	CA	Commercial
P8 – 450 Barnum Avenue	Webster Bank	63 meters	CA	Commercial
P9 – 350 Barnum Avenue	Home Depot	137 meters	CA	Commercial

See the Google satellite map in Figure 2 for the approximate measurement locations. Measurements were made near the proposed west and east Cooling Module units. Sound pressure data were taken with the ExTech sound level meter. Figures 3 and 4 provide photographs of the speaker locations for the West and East positions, respectively. At these locations, a one-minute record of the acoustic noise was analyzed for the speakers in the "on" condition. One minute of background noise data was also analyzed at 5 and 10 meters with the same speaker positions and at the nine nearby property lines.

Airborne noise measurements taken outside are corrupted by rain and wind so a day was selected when the winds were expected to be 10 miles per hour or less. Table 1 provides the weather data in Stratford for the measurements on May 28, 2024. Data was taken from 10:00 am until 1:00 pm. Table 1 shows the temperature and wind speeds in hourly intervals. Wind conditions were very good until noon when the wind speed picked up. The data was not affected because the received levels were high because of the closeness to the speakers to the remaining locations. Also, there was no rain during the testing. Vehicle traffic along Longbrook and Barnum Avenues was heavy and the measurements had to be delayed until all visible traffic was absent.

Because of the distant traffic noise, background noise levels at all of the property line measurement positions were high with levels from 47 to 58 dBA. At all of the measurement locations it was possible to audibly hear the airborne noise from the speaker over the background noise. Airborne noise loss versus range was determined at all nine of these locations.
The highest airborne noise levels were obtained across the railroad tracks at Webster Bank from the East speaker location. These east and west transfer functions were then applied to the 460 KW data from Montville[3] in order to estimate the received levels for the new 460 KW fuel cells in Stratford. Eleven fuel cells could make as much as 10.4 dB more noise than one fuel cell if they were all in one place. Since they are spread out the highest level across the tracks would be across from the middle of the eleven units. Reasonable estimates for this and the other locations were calculated by looking at the relative distances to the property line for each of the eleven fuel cells. At 80 to 90 meters away the correction is 9.4 dB for eleven modules. At 63 meters the correction is 9.2 dB for eleven modules. At 70 meters the correction is 9.3 dB for eleven modules. At 137 meters the correction is 9.7 dB for eleven modules.

Figure 2. Google Map Showing Measurement Positions P1 through P9

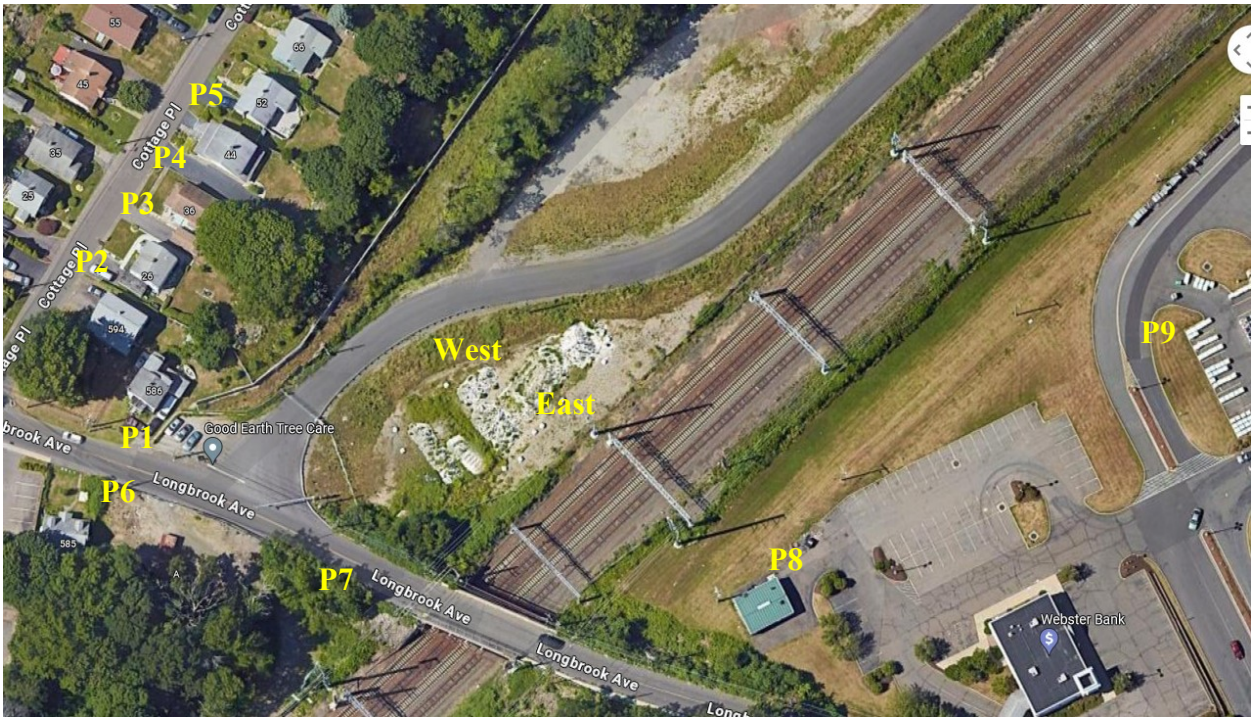


Figure 3. HiAxiom West Cooling Module Location Looking Southeast at Longbrook Avenue

For properties to the west the eleven cooling modules are side by side so the distance to the property is slightly different for each fuel cell. Each cooling module will be modeled at a 10-meter source level of 65 dBA while each power module will be modeled at a 10-meter source level of 61 dBA.[3] The fuel cell module layout is shown in Figure 5 below. The adjustments mean the eleven module source levels increase to about 74.5 dB for the cooling modules and about 70.5 dB for the power modules at a distance of 10 meters. The modules combine for an overall source level of 76 dBA at 10 m.

The west direction requires a combination of cooling module and power module noise. This direction will produce the highest **residential** property line noise levels since the property lines are closest (about 80 meters). The commercial east and south property lines are closer (63 - 137 meters away) and should have slightly higher noise levels. The airborne noise at the property lines is calculated by combining eleven power modules and eleven cooling modules. The Stratford cooling module and power module noise is approximated by adding 9.5 dB to the single fuel cell data from Montville. Calculations are made for all nine locations.

Figure 4. HiAxiom East Location Looking Southeast at Longbrook Avenue

Figure 5. Proposed Fuel Cell Layout

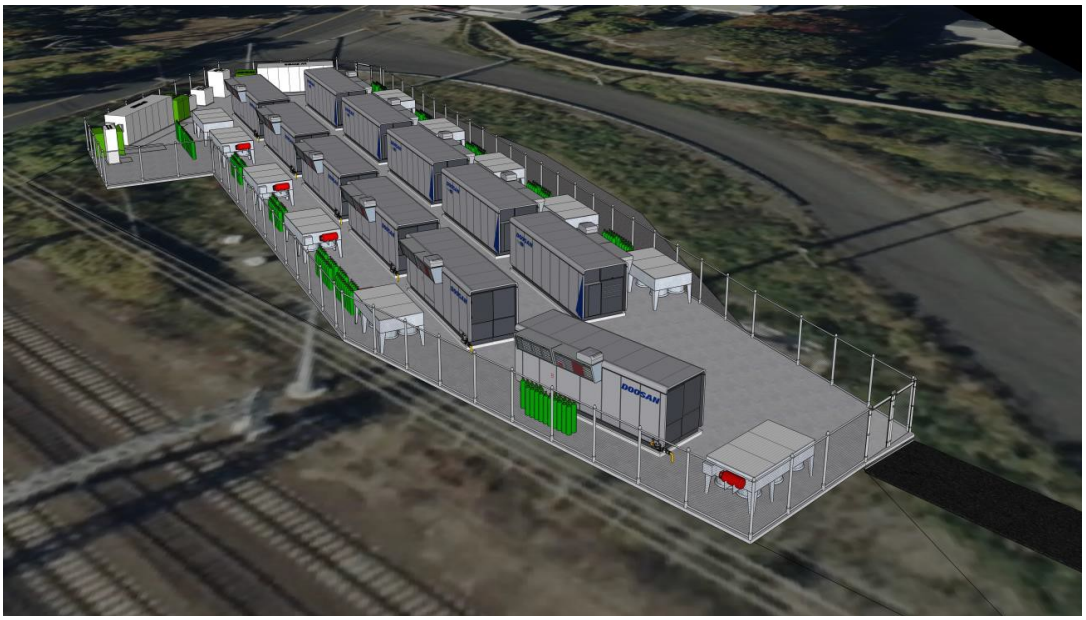


Table 1. Weather Data near Stratford on May 28, 2024
https://www.wunderground.com/history/daily/us/ct/stratford/KBDR/date/2024-5-28

Time	Temp	Dew Point	Humidity	Wind	Wind Speed	Pressure	Condit
8:16 AM	67 °F	66 °F	97 %	SW	9 mph	29.71 in	Mist
8:52 AM	67 °F	66 °F	97 %	SW	12 mph	29.70 in	Mist
9:16 AM	69 °F	65 °F	87 %	SW	9 mph	29.69 in	Mist
9:52 AM	72 °F	65 °F	78 %	SW	10 mph	29.69 in	Haze
10:09 AM	75 °F	63 °F	66 %	W	8 mph	29.68 in	Partly Cloudy
10:52 AM	75 °F	60 °F	60 %	WNW	10 mph	29.69 in	Mostly Cloudy
11:52 AM	75 °F	63 °F	66 %	SSW	17 mph	29.71 in	Mostly Cloudy
12:52 PM	76 °F	60 °F	58 %	SW	16 mph	29.70 in	Fair
1:52 PM	75 °F	59 °F	57 %	SW	14 mph	29.71 in	Fair

Data Analysis

This section analyzes the airborne noise levels measured at the Stratford site and then estimates the received level and transmission loss to nearby properties expected during actual fuel cell operation. These estimated levels will be compared to the noise limits in the Connecticut and Stratford noise ordinances. Speaker operating noise levels at the Stratford site are reported in Table 2 for the west speaker location and Table 3 for the east speaker location. Background noise levels at the Stratford site are reported in Table 4. The background data are used to correct the received speaker levels providing estimates in Table 5 of only the speaker noise contribution at each location. Table 5 also reports the transfer functions and the operating noise levels estimated for the proposed eleven new 460 KW fuel cells at 540 Longbrook Avenue.

Table 2. Overall Sound Pressure Levels in dBA ref. 20 microPascals with West Speaker On

Location	Range in Meters	Location	Leq	Max	Min	L90
Speaker On	5	West	98.4	99.1	96.1	**98.3**
Speaker On	10	West	92.4	93.3	92.1	**92.3**
West Speaker						
586 Longbrook	78	Southwest	59.9	71.6	59.2	**59.4**
26 Cottage PL	89	West	57	66.7	51.2	**51.7**
36 Cottage PL	83	West	52.1	56	49.7	**50**
44 Cottage PL	81	West	56.2	68.6	50.9	**51.2**
66 Cottage PL	81	West	52.7	66.6	51.4	**52**
585 Longbrook	94	Southwest	61.8	80.1	51.1	**61.3**
A Longbrook	70	South	69.9	74.6	65.5	**67.1**

Leq: Equivalent continuous sound level over the measurement period. – **this is normally the level to be identified as the value to be compared with the steady state overall noise requirement. Because of the heavy traffic noise, the L90 value is used instead.**

SPL MAX: Maximum one-second sound level observed during the measurement period.
SPL MIN: Minimum one-second sound level observed during the measurement period.
L90: - 90% percentile sound level –L90 is the level that is exceeded 90% of the time.
The CT State Noise Ordinance[1] identifies the L90 acoustic calculation as useful in determining background airborne noise. **This value will also be used as the background noise level.**

Table 3. Overall Sound Pressure Levels in dBA ref. 20 microPascals with East Speaker On

Location	Range in Meters	Location	Leq	Max	Min	L90
Speaker On	5	East	98.1	98.9	95.6	**98**
Speaker On	10	East	92.5	93.5	91	**90.7**
East Speaker						
450 Barnum	63	Southeast	78	80.4	75.8	**76.4**
350 Barnum	137	East	67.7	72	63.2	**64.5**

The overall airborne noise levels are about 25 dB higher for the speakers as compared to what was measured from the HiAxiom 460 KW cooling module at Montville, CT. These 25 dB differences in level were subtracted from the Stratford measured levels to estimate the expected fuel cell acoustic signature for one fuel cell. Column 4 of Table 5 provides the background corrected data for the property line measurements. The transfer function to each property line is shown in column 5 and the estimated level for eleven fuel cells in shown in column 6. The 10-meter Montville airborne noise levels were used with the Stratford transmission loss data to estimate the expected eleven fuel cell airborne noise at the nine nearby neighbors. Only the location closest to the fuel cells at 450 Barnum Street is near the 66 dBA noise limit. All the locations measured meet both the residential day time and night time noise requirements as well as the commercial noise limit.

Note: The Cottage Place measurements were made in the front yard at the driveway so the houses were not blocking the sound from the speakers. The lots on Cottage Place appear to be about 100 feet deep so measurements in the back yard could be as much as 33 meters closer than the front yard. Typical spreading loss calculations indicate this would result in as much as 4 dB higher levels in the backyard. The 4 dB increase would mean the Cottage Place residences would still be at least 12 dB below the night time noise limit.

Acoustical Technologies Inc.

Table 4. Overall Sound Pressure Levels in dBA ref. 20 microPascals with **Speakers Off**

Location	Range in Meters	Direction	Leq	Max	Min	L90
586 Longbrook	78	Southwest	52.5	54.7	51.3	51.5
26 Cottage PL	89	West	52.8	57	50.3	51.3
36 Cottage PL	83	West	51.3	53.8	49.4	50.1
44 Cottage PL	81	West	49.3	54.1	46.6	47.6
66 Cottage PL	81	West	54.0	68.7	46.7	47.2
585 Longbrook	94	Southwest	54.2	79.4	53.2	53.4
A Longbrook	70	South	57.0	62.3	548	55.0
450 Barnum	63	Southeast	56.4	59.4	54.4	55.0
350 Barnum	137	East	58.4	60.5	56.5	57.5

Table 5. Background Corrected L90 Sound Pressure Levels in dBA ref. 20 microPascals

Location	Range in Meters	Direction	L90 Estimate	Transfer Function	Property Line	Night Spec	Over Spec
West Speaker			In dBA	In dB	dBA	dBA	dBA
586 Longbrook	78	Southwest	58.7	-33.6	42.4	51	-8.6
26 Cottage PL	89	West	48.9	-43.4	32.6*	51	-18.4
36 Cottage PL	83	West	47	-45.3	30.7*	51	-20.3
44 Cottage PL	81	West	49.6	-42.7	33.3*	51	-17.7
66 Cottage PL	81	West	50.8	-41.5	34.5*	51	-16.5
585 Longbrook	94	Southwest	60.6	-31.7	44.3	66	-21.7
A Longbrook	70	South	66.8	-25.5	50.5	66	-15.5
East Speaker							
450 Barnum	63	Southeast	76.4	-14.3	61.7	66	-4.3
350 Barnum	137	East	63.7	-27	49	66	-17

Note: * Backyard noise levels could be as much as 4 dB higher than front yard levels

Allowable Noise Levels

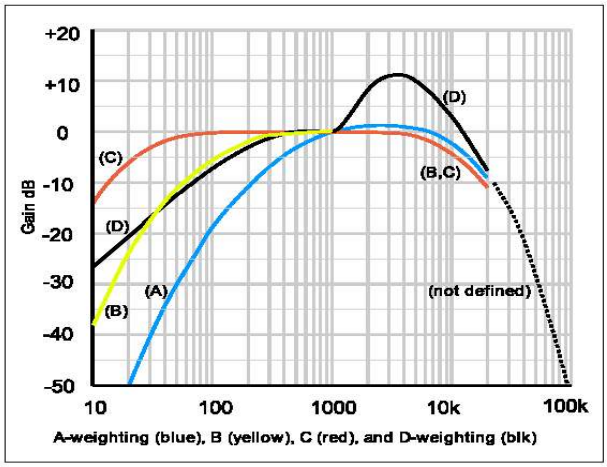
Connecticut's regulation for the control of noise provides in *CT section 22a-69*-3[1] the requirements for noise emission in Connecticut. *Section 22a-69*-3.1 states that no person shall cause or allow the emission of excessive noise beyond the boundaries of his/her Noise Zone so as to violate any provisions of these Regulations. The CT ordinance will be used to evaluate the noise generated by the HiAxiom 460 KW Fuel Cells. (The Stratford noise ordinance has the same noise limits.) Following sections discuss each type of noise using the results obtained from the May 28, 2024 speaker measurements in Stratford and the HiAxiom 460 KW fuel cell test in Montville, CT reported on July 13, 2020.

The Stratford site is located in an Industrial Zone on Longbrook Avenue and is surrounded by Residential and Commercial Zones. The closest residential zone on Cottage Place is about 40 meters away. Based on the analysis resulting in Table 5 the airborne noise from the eleven new fuel cells should be well below the 51 dBA noise limit at distances greater than 40 meters. All residential properties at greater distances are expected to be well below the day time and night time Residential Zone noise limits for an emitter in an Industrial zone. The closest commercial zone on Barnum Road is about 45 meters away. Based on the analysis resulting in Table 5, the airborne noise from the eleven new fuel cells should be well below the 66 dBA noise limit at distances greater than 45 meters. All other commercial properties at greater distances are expected to be well below the Commercial Zone noise limits for an emitter in an Industrial zone.

Impulse Noise

The Connecticut noise code states in *CT section 22a-69*-3.2 (part a) *Impulse Noise* that no person shall cause or allow the emission of impulse noise in excess of 80 dB peak sound pressure level during the night time to any class A Noise Zone. Night time is defined as 10 pm to 7 am. *CT section 22a-69-3.2 (part b) Impulse Noise* states that no person shall cause or allow the emission of impulse noise in excess of 100 dB peak sound pressure level at any time to any Noise Zone. The Stratford noise ordinance sets the same limits for Impulse Noise.

Figure 6. Acoustic Airborne Noise Weighting Curves



Impulse noise in excess of 80 dBA was not observed during any of the ten property line measurements of the Doosan 460 KW fuel cell made at the Montville site on 7 July, 2020[3]. The maximum level measured was 79.7 dBA at location P2 using the ExTech sound level meter. This and the other levels above 70 dBA were caused by vehicle traffic and not by the fuel cell. Unweighted impulse noise levels were determined using a Hewlett Packard HP3561A spectrum analyzer. (The maximum level ten meters from the fuel cell was 77 dBA.) The closest Stratford property showed 14 dB of transmission loss so the highest expected level would be below 64 dB. Given the steady state nature of the fuel cell's noise signature there should be no acoustic issues with the State of Connecticut's or the Town of Stratford's impulse noise requirements.

A few words are in order to discuss the difference between A-weighted and un-weighted impulse noise. A-weighting emphasizes the middle and higher frequencies while reducing the influence of the low frequencies. Figure 6 above plots the A-weighting curve versus frequency in blue. Below a frequency of 1 kiloHertz the acoustic level is attenuated by increasing amounts. The reduction is about 10 dB at 200 Hertz, 20 dB at 90 Hertz and 30 dB at 50 Hertz. It also reduces the level at very high frequency being down in level by 10 dB at 20 kiloHertz. The fuel cell measurements show the unweighted overall levels to be about 9 dB higher than the A-weighted noise levels. Adding 9 dB to the Montville measured levels brings the peak impulse up to about 73 dB reference 20 microPascals. The impulse noise levels on Barnum Road should be no higher than 73 dB reference 20 microPascals, well below both the 80- and 100-dB limits.

Prominent Discrete Tones

The Connecticut regulation for the control of noise states in *CT section 22a-69-3.3 Prominent discrete tones:* Continuous noise measured beyond the boundary of the Noise Zone of the noise emitter in any other Noise Zone which possesses one or more audible discrete tones shall be considered excessive noise when a level of 5 dBA below the levels specified in section 3 of these Regulations is exceeded. The CT Regulations establish different noise limits for different land use zones. Residential (homes and condominiums) and hotel uses are in Class A. Schools, business, parks, recreational activities and government services are in Class B. Forestry and related services are in Class C. By my reading of the regulations the Stratford fuel cells are a Class C emitter in an Industrial Zone. The noise zone standards in *CT section 22a-69-3.5* state that a Class C emitter cannot exceed the following overall sound pressure levels:

To Class C 70 dBA To Class B 66 dBA To Class A 61 dBA (day) 51 dBA (night)

The discrete tones limits are 5 dBA lower so that no tone may be higher than the following:

To Class C 65 dBA To Class B 61 dBA To Class A 56 dBA (day) 46 dBA (night)

The Stratford noise ordinance does not discuss discrete tones so the CT Noise Ordinance will be used. To address the discrete tone issue, we use measured spectral data from the Reference 3 Montville testing. The data is the maximum level received in 1/30 octave bands for frequencies from 0.32 to 100,000 Hz. Figure 7 plots the airborne noise measured 10 meters from the Cooling and Power Modules in 1-30th octave bands. This figure shows some discrete tones in the middle

frequencies produced by the HiAxiom Fuel Cell Cooling and Power Modules. The eight largest tones are given in Table 6. The highest is 55.1 dB reference 20 microPascals at 302 Hz. The second highest tone is at 213.8 Hz at a level of 54.3 dB reference 20 microPascals. All the remaining tones are below 53 dBA. The A-weighted discrete tone corrections are given in the 4th row of Table 6. Incorporating the transmission loss to the properties gives the A-weighted levels in the last five rows of Table 6 after the 9.5 dB correction for eleven units is added. All the frequencies at the nearest residences on Cottage Place have levels that are at least 15 dB below the 46 dBA requirement in a Residential Zone. All the nearby residential properties should meet all the discrete tone requirements. The closest commercial property is given in the last row of Table 6. The expected level is at least 10 dB below the limit of 61 dBA. There should be no acoustic issue with the CT discrete tone noise requirements at any of the nearby properties.

Figure 7. Montville Tones 460 KW Fuel Cell Cooling & Power Modules in 1-30th octave bands

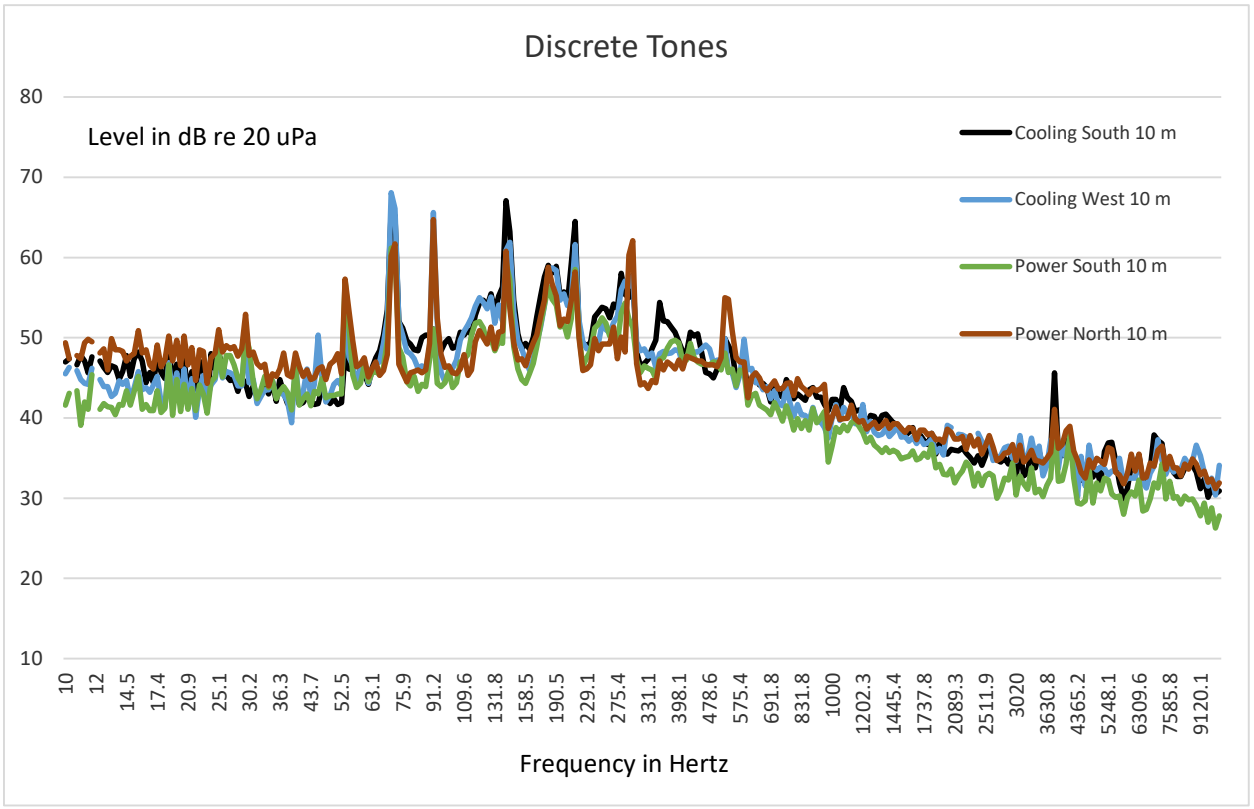


Table 6. Peak Discrete Sound Pressure Level Estimates in dB ref. 20 microPascals

Location	Range Meters	53.7 Hz	70.8 Hz	91.2 Hz	141.3 Hz	213.8 Hz	302 Hz	3801 Hz	4169 Hz
Allowed Level		**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
Montville	10	57.3	68.1	65.6	67.1	64.5	62.1	45.6	39
A Weighting		-29.0	-24.3	-20.5	-14.7	-10.2	-7.0	1.0	0.9
Stratford 1 unit	10	28.3	43.8	45.1	52.4	54.3	55.1	46.6	39.9
11 Fuel Cells	10	37.8	53.3	54.6	61.9	63.8	64.6	56.1	49.4
586 Longbrook	78	4.2	19.7	21	28.3	30.2	31	22.5	15.8
26 Cottage PL	89	-5.6	9.9	11.2	18.5	20.4	21.2	12.7	6
36 Cottage PL	83	-7.5	8	9.3	16.6	18.5	19.3	10.8	4.1
44 Cottage PL	81	-3.7	11.8	13.1	20.4	22.3	23.1	14.6	7.9
450 Barnum	63	23.5	39	40.3	47.6	49.5	50.3	41.8	35.1

Infrasonic and Ultrasonic Noise

The Connecticut regulation for the control of noise states in *CT section 22a-69-3.4 Infrasonic and Ultrasonic* that no person shall emit beyond his/her property infrasonic or ultrasonic sound in excess of 100 dB at any time. 100 dB with respect to the reference of 20 microPascals is a sound pressure of 2 Pascals or 0.00029 psi. Infrasonic sounds are sound pressure fluctuations below a frequency of 20 Hertz. Ultrasonic sounds are sound pressure fluctuations at frequencies above 20,000 Hertz. There is no mention in the Stratford Noise Ordinance that limits infrasonic or ultrasonic noise so the State of CT Noise Ordinance will be used.

Narrow bandwidth sound pressure spectrums in dB reference 20 microPascals made at the Montville western 10-meter Cooling Module location can be used to compare with the infrasonic and ultrasonic noise requirements. The Montville airborne noise data were processed in the 0 to 200 Hertz and 0 to 100,000 Hertz frequency ranges. The bandwidth of each data point is 0.75 Hertz for the 200 Hertz range and 375 Hertz for the 100,000 Hertz frequency range. The infrasonic noise for frequencies up to 20 Hertz is shown in Figure 8 for the 460 KW unit at Montville[3]. The maximum level at 10 meters is 48 dB reference 20 microPascals. The entire 20 Hertz band can be power summed and never exceeds 70 dB reference 20 microPascals at 10 meters in Montville. After subtracting 14.3 dB for the maximum transfer function correction at Point P8, the closest site, and adding the gain of 9.5 dB for eleven units, the 65.2 dB level is well below the Infrasonic requirement of 100 dB for the Stratford site. The noise levels at all the other nearby residential and commercial neighbors will be lower. There should be no issue with the infrasonic noise requirement at any of the neighboring residential properties.

The ultrasonic noise for frequencies up to 100 KiloHertz is given in Figure 9. The Montville data uses a microphone with flat high frequency performance and provides a good estimate for

the 460 KW fuel cell. The entire 80 KiloHertz band from 20 to 100 kiloHertz has been power summed and never exceeds a noise level of 62 dB reference 20 microPascals 10 meters from the fuel cell at Montville. After subtracting 14.3 dB for the maximum transfer function correction at Point P8, the closest site, and adding the gain of 9.5 dB for eleven units, the ultrasonic level of about 57.2 dB is well below the requirement of 100 dB for the Stratford site. The noise levels at all the other nearby residential and commercial neighbors will be lower and there should be no issue with ultrasonic noise at any of the neighboring properties.

Figure 8. Infrasonic Noise from Montville Fuel Cell Cooling Modules in 1-30th octave bands

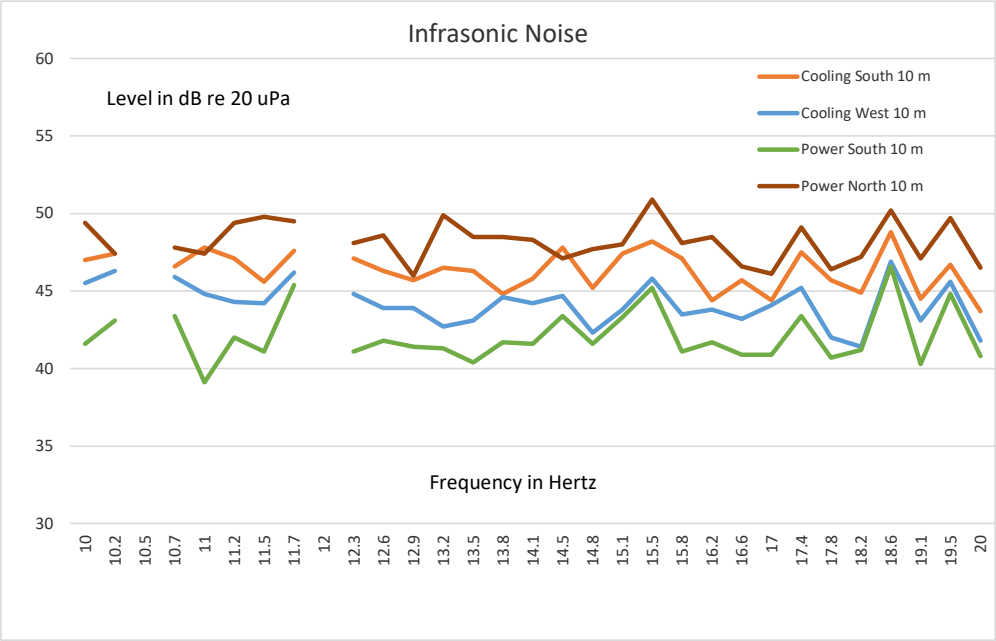
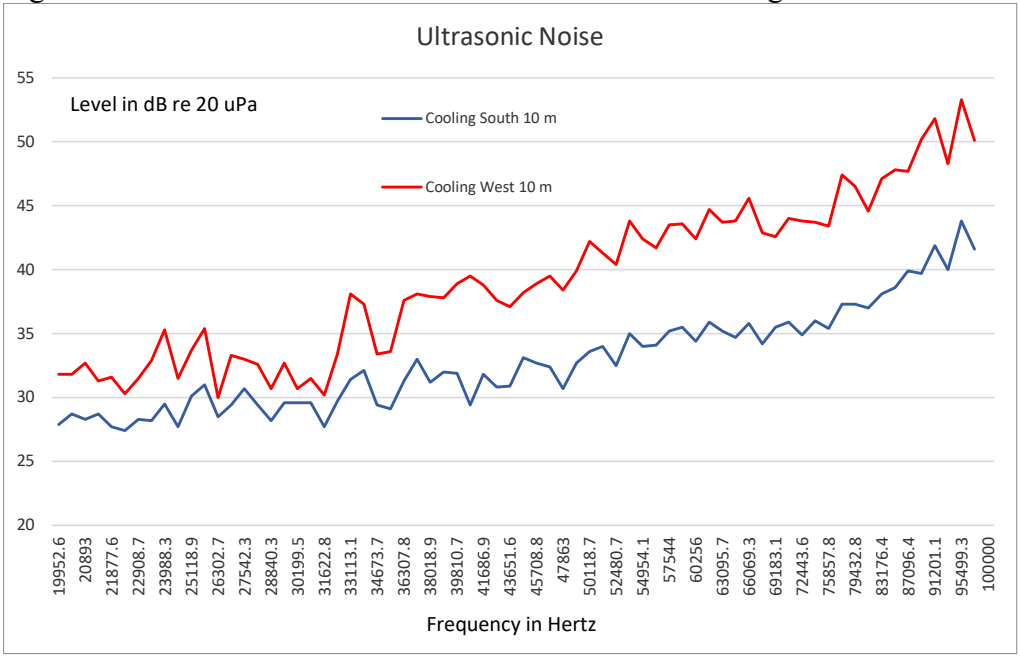


Figure 9. Ultrasonic Noise from Montville Fuel Cell Cooling Modules in 1-30th octave bands



Overall Sound Pressure Levels

The Connecticut regulations for the control of noise state that
(a) No person in a Class C Noise Zone shall emit noise exceeding the levels below:

To Class C 70 dBA To Class B 66 dBA To Class A 61 dBA (day) 51 dBA (night)

The Stratford site is in an Industrial Zone that has surrounding Residential and Commercial Zones. The nearby neighbors in RS-4 residential zones have airborne noise limits of 61 dBA during the day and 51 dBA at night. The Commercial Zone limit is 66dBA.

The estimated overall A-weighted sound pressure levels for eleven fuel cells in dBA reference 20 microPascals are given in column 6 of Table 5 above using the background corrected measurements made on May 28, 2024. The second column gives the approximate distance from the fuel cells to the measurement location, with locations identified by a P number in Figure 2. Column 3 gives the direction from the fuel cell to the property. The airborne noise values given in columns 4 are the estimated received level for one speaker. Transfer functions in column 5 provide the loss in sound level from the fuel cells to the property lines. The values in column 6 provide the estimated airborne noise levels at the property lines with eleven fuel cells operating. The values are all below both the residential and commercial noise limits. Operation of the eleven HiAxiom fuel cells will have no significant acoustic impact on the nearby properties adjacent to the HiAxiom fuel cell site on Longbrook Avenue.

All of the nearby residential and industrial properties should not be affected by the operation of the eleven fuel cells.

Conclusions

The purpose of this effort is to evaluate the acoustical environment at the Stratford site during operation of the eleven HiAxiom 460 KW fuel cells. This effort has been accomplished and the results show that the operation of the eleven HiAxiom 460 KW fuel cells will meet all of the State of Connecticut and Town of Stratford airborne noise requirements at all the nearby properties. All the residences should be more than 8 dB below the night time noise requirement while all commercial properties should be more than 4 dB below the commercial requirement.

References

1) CT DE&EP *Noise Control Regulation RCSA Section 22a-69*-1 to 22a-69-7.4
http://www.ct.gov/dep/lib/dep/regulations/22a/22a-69-1through7.pdf

2) Stratford Noise Ordinance, stratfordnoiseordinancepdf.pdf

3) Town of Montville Water Pollution Control Authority Airborne Noise Test
At 83 Pink Row, Acoustical Technologies Inc., July 13, 2020


Attachment 5


Attachment 5

Attachment 6

Proposed Interconnection Point
UI Pole #7623

180'-1"
Interconnection Route

224'-9"

Original Site Boundary

Primary Electric Utility Connection to Site

Gas Service

Perimeter Chain Link Fence

Construction Easement

11'-0"

24'-0"

680 ft²

6'-2"

45'

DOT Easement (Permanent)

3115 ft²

126'-0"

90'-2"

ZONING SETBACK, FRONT
PROPERTY 20' PLUS 25'

Fuel Cell FC-1
Fuel Cell FC-2
Fuel Cell FC-3
Fuel Cell FC-4
Fuel Cell FC-5
Fuel Cell FC-6
Fuel Cell FC-7
Fuel Cell FC-8
Fuel Cell FC-9
Fuel Cell FC-10
Fuel Cell FC-11

Concrete Site Pad

10'-10"

GAS SERVICE

Primary Metering Unit

HV SW. GEAR

2500 KVA FC XFMR

2500 KVA FC XFMR

1500 KVA FC XFMR

Spare N2 Bottles

Cooling Module

N2 Bottle Rack

5'-0"

13'-6"

7'-7"

29'-4"

8'-7"

SPARE N2

14864 ft²

20'

WATER SERVICE VAULT (TBD)

Water Service

3707 ft²

Reserved for Drainage (TBD)

20'

22'-0"

27'-6"

45'-6"

1'-02"

N

GENERAL ARRANGEMENT
SCALE: 1"=10'

10' 50'

HyAxiom
A Doosan Company

540 LONGBROOK AVE, STRATFORD CT - FORMER CONTRACT PLATING SITE

REVISIONS

	MM/DD/YY	REMARKS
1	04/08/24	Rev A01 - Concept Design for SCEF Round 5 Bid Review. Drawn By: A. Kellogg
2	07/29/24	Rev B01 - Updated Concept Design based on DOT Easement and UI Temporary Work Area
3	08/19/24	Rev B02 - Updated Concept Design w/ CSC Requested Information
4	__/__/__	--
5	__/__/__	--

01
B

Coastal Site Boundary Map

Attachment 7