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October 1, 2021

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

Re: Petition 1458 - Responses to Allco Renewable Energy Limited
Interrogatories

Dear Ms. Bachman:

Homestead Fuel Cell 1, LLC ("HFC1") hereby submits to the Connecticut Siting Council ("Council") its responses to the Allco Renewable Energy Limited September 17, 2021 interrogatories. An original and 15 copies of HFC1's responses will be hand delivered to the Council.

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

Very truly yours,



Bruce L. McDermott

Enclosure

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Interrogatory ARE-1

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-1: Referring to Petition page 6 and the following statement therein: “The Project will provide the state’s electrical system with additional generating capacity that will meet demand using renewable energy, upgrade grid infrastructure, contribute to grid stability and foster the redevelopment and reuse of an underutilized property.”

- a. Explain how the Project uses renewable energy.
- b. What source of renewable energy will the Project use?
- c. Explain how the Project would upgrade grid infrastructure.
- d. Explain how the Project would contribute to the state’s grid stability.
- e. Do you have any independent third-party, science-based analyses that reach the conclusion that using natural gas for electricity generation is using renewable energy?

If so, please provide it.

A-ARE-1: The basis of Allco’s request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, “In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state.” HFC1 objects to this interrogatory since it is not related to the Project’s potential impact on air, water or natural resources of the state.

Interrogatory ARE-2

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-2: Referring to Petition page 6 and the following statements therein: “The State of Connecticut has articulated its energy goals in the Comprehensive Energy Strategy (“CES”) as encouraging the provision of cheap, clean, reliable electricity, fostering the development of microgrids and promoting economic development and job growth. As a distributed, baseload source of electricity, the Project will reduce the electric load that would otherwise be required of the electric grid, thereby reducing stress on the system and reducing load on overloaded transmission lines. The fuel cell power plants will be manufactured in Connecticut, and installed and operated by FCE on behalf of HFC1. Thus, the Project satisfies the articulated goals of the CES.”

- a. Please provide the citations to the CES that support those statements.
- b. Explain how the Project can be considered to generate “clean” electricity.
- c. Explain how the Project can be considered to generate “cheap” electricity.
- d. Explain how the Project will reduce the electric load.
- e. Explain how the Project will foster the development of microgrids.
- f. Explain how the Project will reduce the load on the transmission system in light of the fact that section 2.2.5 of the DEEP RFP in which the Project was selected requires that the Project’s electricity be delivered to a New England Pool Transmission Facility (“PTF”).

A-ARE-2: The basis of Allco’s request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, “In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state.” HFC1 objects to this interrogatory since it is not related to the Project’s potential impact on air, water or natural resources of the state.

Interrogatory ARE-3

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-3: Referring to Petition page 8 and the following statements therein: “While HFC1 currently has no immediate plan to install a fourth system, HFC1 wishes to advise the Council that HFC1 bid into the recent SCEF Year 2 RFP for such a project and, if selected, HFC1 will submit an amendment to this Petition to the Council for the planned installation of a fourth separately metered (and entirely separate fuel cell system as permitted under the SCEF Rules).”

- a. Now that the results of the SCEF Year 2 RFP are known, do you intend to construct a fourth system? If so, please explain. If not, please explain.

A-ARE-3: The basis of Allco’s request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, “In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state.” HFC1 objects to this interrogatory since it is not related to the Project’s potential impact on air, water or natural resources of the state.

Interrogatory ARE-4

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-4: Referring to Petition page 9 and the following statements therein: “A feasibility study was conducted by Eversource and completed in December of 2018. That study confirmed that the Northwest Hartford Substation could accommodate the generation of the fuel cell plant with minor upgrades. However, that study has since expired, and HFC1 has requested a new application for an updated feasibility study and likely an associated System Impact Study.”

- a. With an expired study and no system impact study, please explain how Petitioner satisfied, and continues to satisfy, the DEEP RFP requirement under section 2.2.5 that required, and requires, the Petitioner to “demonstrate how the power will get to the PTF, interconnect at the Capacity Capability Interconnection Standard, demonstrate delivery without material constraint or curtailment and show upgrade necessary to ensure full deliverability”.

A-ARE-4: The basis of Allco’s request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, “In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state.” HFC1 objects to this interrogatory since it is not related to the Project’s potential impact on air, water or natural resources of the state.

Interrogatory ARE-5

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-5: Referring to Petition page 11 and the following statements therein: "It is also important to note that FCE has previously developed, installed, and operated two separate fuel cell systems in the City of Hartford at Trinity College and at Hartford Hospital. Both of these projects were approved by the Council. See Petition Nos. 1317 (Trinity College) (Approved, September 15, 2017); and Petition No. 1067 (Hartford Hospital) (Approved, July 25, 2013)."

- a. Please explain why it is important to note that FCE has developed those two fuel cell systems.

A-ARE-5: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state."

Interrogatory ARE-6

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-6: Referring to Petition page 11 and the following statement therein: "The Project will provide up to 8.4 MW of clean electrical energy without the environmental impacts normally associated with the use of natural gas as a fuel."

- a. Please explain how the Project provides clean electrical energy.
- b. Please explain Your definition of clean in the phrase "clean electrical energy."

A-ARE-6: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state.

Interrogatory ARE-7

Homestead Fuel Cell 1, LLC

Witness: Lawrence Hoffman

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Q-ARE-7: Referring to the Facility Sound Assessment prepared by Modeling Specialties dated October 26, 2020:

- a. Page 6 states that a wind screen was used. The manual for the RION NA-28 states that the wind screen is recommended only "When making outdoor measurements in windy weather or when measuring air conditioning equipment or similar." Why was the windscreen used?
- b. What effects on sound measurement does the wind screen have?
- c. Why was the microphone placed at a height of five feet?
- d. What is the effect of changing the height of the microphone?
- e. Page 8 states that sound from "short term or infrequent sources" were excluded. What short term or infrequent sources were excluded?
- f. Reference page 8, what was the L10 measurement for Homestead Ave @ Fence at 12:20AM?
- g. Reference page 8, what was the L10 measurement for Homestead Ave @ Fence at 11:47AM?

A-ARE-7: Referring to the Facility Sound Assessment prepared by Modeling Specialties dated October 26, 2020:

- a. As stated in ANSI S12.18 and ANSI S1.13 standards regarding methods for taking outdoor sound pressure levels, a wind screen should be used for all outdoor measurements. Per ANSI S1.13, 9.2.3 "A suitable wind screen or nose cone approved by the manufacturer of the sound level meter shall be fitted over the microphone for all outdoor measurements..." For this reason, for all environmental sound level measurements Modeling Specialties use a manufacturer recommended wind screen.
- b. Depending on the materials and density of the wind screen, there is a potential to affect the very highest frequency bands of the measured sound. The open cell foam design of the NA-28 sound level meter affects only the highest frequencies (beyond the range of human hearing and A-weighting scale). While this might be considered important for laboratory

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Homestead Fuel Cell 1, LLC

Witness: Lawrence Hoffman

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analysis, the wind screen has no potential to affect the measured level in outdoor background sound environment.

c. The microphone was placed at the height of 5 feet (1.5m) per ANSI standards S12.18 and S1.13 to represent the height of the ears of a typical standing (or walking) person on the sidewalk.

d. Since outdoor sound is based on propagation of sound through air from many sources at various distances, it can be affected by proximity to large flat surfaces (which can include the ground). Sound could be absorbed by the ground or reflected by the ground, depending on the geometric relationship between the source, receiver and character of the ground. The level measured at a significantly higher or lower height could be higher or lower than documented in the study. Per ANSI S1.13 sec. 9.2.5, "the selection of microphone position for measurement of sound of interest will depend on the purposes of the measurement...For instance, if the sound of interest were that at the operator's position in front of a computer or machine tool, heights of 1.2 m for seated operators and 1.5 m for standing operators are generally employed. For general outdoor measurements, microphone heights of either 1.2 or 1.5m above the ground are often used."

e. The "Background Noise" is defined in RCSA § 22a-69-1.2 as the level "which is exceeded 90% of the time (L_{90}) in which the measurement is taken". The sound meter takes many short samples, performing calculations on the levels to produce the metrics. The use of the L_{90} metric implies that 90% of the samples are screened from the metric. The resulting L_{90} represents the quietest 10% of the many samples. In addition, two specific sources were screened at the time of the measurements. During the nighttime sample, a very loud truck moving at a high rate of speed moved through the area. In preparation for the intrusion, the meter was "paused" to prevent an anticipated "meter overload" during the vehicle passing. The meter was re-started when the truck was out of the area. During the daytime, just as the meter was being launched, a bobcat loader was started nearby. The meter was stopped because the event sound would not represent typical background sound for the area. The meter remained in "pause" until the vehicle completed loading a truck and both the loader and truck were quieted. In this case, the meter was reset, starting a new measurement interval after the event was complete.

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Homestead Fuel Cell 1, LLC

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- f. The "Background Noise" is defined in RCSA §22a-69-1.2 as the level "which is exceeded 90% of the time (L_{90}) in which the measurement is taken". For this reason, the analysis was based on the L_{90} level. However, other metrics were documented. The requested L_{10} level was measured at the Homestead Ave @ Fence at 12:20AM to be 57 dBA
- g. The "Background Noise" is defined in RCSA §22a-69-1.2 to be the level "which is exceeded 90% of the time (L_{90}) in which the measurement is taken". For this reason, the analysis was based on the L_{90} level. However, other metrics were documented. The requested L_{10} level was measured at the Homestead Ave @ Fence at 11:47AM to be 70 dBA.

Interrogatory ARE-8

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-8: Reference page 9 the Facility Sound Assessment prepared by Modeling Specialties dated October 26, 2020 and the statement: "This analysis represents the most likely sound levels to be expected as a result of the normal operation of the facility using manufacturer's data and measurements of similar equipment at other fuel cell installations."

- a. What is the confidence level that equates to the reference "most likely"?
- b. What data and measurements did the manufacturer provide?
- c. Did Modeling Specialties take its own sound measurements of existing Fuel Cell Energy facilities? If no, why not? If yes, please provide that data.

A-ARE-8: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state.

Interrogatory ARE-9

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-9: Reference page 9 the Facility Sound Assessment prepared by Modeling Specialties dated October 26, 2020 and the statement: "A computer model was developed for the facility's sound levels based on conservative sound propagation principles prescribed in the acoustics literature.

- a. What software was used for the computer model?
- b. Please provide all assumptions that were input into the computer model?
- c. Please elaborate on what sound propagation principles are referred to?
- d. Please list what acoustics literature is referred to.

A-ARE-9: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state.

Interrogatory ARE-10

Homestead Fuel Cell 1, LLC

Witness:

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- Q-ARE-10: Reference page 9 the Facility Sound Assessment prepared by Modeling Specialties dated October 26, 2020 and the statement: "There are several sources of modest sound at the facility. Under normal conditions, most of those sources will produce consistent sound through the day and night. Several sources will cycle on and off as required by the facility operation."
- a. Please list the "several sources of modest sound at the facility."
 - b. What sources "will produce consistent sound through the day and night."
 - c. What sources "will cycle on and off."
- A-ARE-10: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state.

Interrogatory ARE-11

Homestead Fuel Cell 1, LLC

Witness:

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- Q-ARE-11: Reference Table 2 and Table 3 of the Facility Sound Assessment prepared by Modeling Specialties dated October 26, 2020. Please provide projected the L_{eq} , the L_{10} and the L_{90} measurements at 12:20AM for each of the receptors listed in Table 3 (under conditions similar to those that existed at 12:20AM on October 8, 2020).
- A-ARE-11: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state.

Interrogatory ARE-12

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-12: Please list what other fuel cell facilities that Fuel Cell Energy Inc. or an affiliate has installed and that are currently operating in the State of Connecticut.

A-ARE-12: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state.

Interrogatory ARE-13

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-13: Has there been a noise study or review of the any of the facilities listed in the answer to interrogatory #12 since commencement of commercial operation? If so, please provide it.

A-ARE-13: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state.

Interrogatory ARE-14

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-14: Referring to the list of the facilities listed in the answer to interrogatory #12:

- a. What has been the availability factor of each of those facilities since commencement of commercial operation?
- b. What has been the capacity factor of each of those facilities since commencement of commercial operation?
- c. What has been the efficiency factor of each of those facilities since commencement of commercial operation?
- d. Have there been any issues with the operation of any of those facilities? If so, please explain what issues there have been and how they have been addressed.
- e. Have there been any complaints made by nearby residents with the operation of any of those facilities? If so, please provide a copy of the complaints.
- f. Has there been an independent, third-party analysis done to determine the non-CO2 emissions produced by any of those facilities? If so, please provide it.
- g. Has there been an independent, third-party analysis done to determine the CO2 emissions produced by any of those facilities? If so, please provide it.
- h. Has there been an independent, third-party analysis done of the levels of hazardous materials in the fuel cell stack of any of those facilities? If so, please provide it.
- i. Has there been an independent, third-party analysis done of the levels of hazardous materials in the components in the fuel processing system of any of those facilities? If so, please provide it.
- j. Please provide a copy of your procedures for removing and disposing of hazardous materials that exist in the cell stack assemblies and components in the fuel processing system.

A-ARE-14: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-15

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-15: Referring to Petition page 26 and the statement therein that the height of the facility will be “approximately 33 feet above ground level.”

- a. At Petition page 21 it is claimed that “[t]he proposed facility will not be visible from residential areas.” Identify the structures that are higher than 70’ and in-between the Project and residential areas.
- b. Will any part of the Project be viewable from the locations listed under the “Receptor” heading of Table 1. If so, which locations?

A-ARE-15: The basis of Allco’s request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, “In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state.” HFC1 objects to this interrogatory since it is not related to the Project’s potential impact on air, water or natural resources of the state.”

Interrogatory ARE-16

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-16: Referring to Petition page 20, Table 2 and Table 3:

- a. How many lbs CO₂ are produced per megawatt-hour of electricity from the fuel cells?
- b. How many lbs CO₂ are produced per megawatt-hour of electricity from the gas fired start up burners?
- c. Table 3 states that 644 tpy CO₂e of methane is an emission from the facility. How much methane is released per megawatt-hour of electricity?
- d. Please provide an independent, third-party analysis of that supports that numbers listed in Tables 2 and 3.

A-ARE-16:

- a. 980 lbs of CO₂ are produced per megawatt-hour.
- b. Because the gas-fired burners do not produce electricity but are used only for heat management of the fuel cells, it is not possible to assign a power-normalized CO₂ emissions factor to them. The gas-fired burner does not typically run during power operations; it is used only for plant heat-up, cool-down and during low power operation necessary to ramp power up to and down from the normal power output operating point.
- c. Approximately 0.8 lb of CH₄ is released per megawatt-hour.
- d. Title Cover Page and Results Summary Table Page excerpts from the emissions test report prepared for product Certification by the California Air Resources Board as a Distributed Generation Unit of the SureSource 3000 fuel cell power plant are provided as Attachment ARE-16-1. The attachment provides data on Carbon Dioxide, NO_x, CO and VOC emissions. Methane emissions are not part of the CARB DG Certification program and are not measured or reported. Methane emissions data reported in the Petition and this Interrogatory response are from informational self-measurements, as are the particulate matter results. Oxides of sulfur are based on calculations of input fuel and air sulfur concentrations (the actual emissions are so low as to be extremely

Interrogatory ARE-16

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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difficult to measure) and are considered very conservative as sulfur would actually be absorbed by the fuel cell components.

Interrogatory ARE-17

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-17: Referring to Petition page 21 and the statement therein: "With regard to methane emissions specifically, the methane is normally completely converted to hydrogen by the reforming reaction within the fuel cell stacks, but any remaining unconverted methane (for example at low power conditions) is destroyed by a subsequent catalytic oxidation reactor in the fuel cell process. Between the reforming and oxidation processes, virtually all of the methane is destroyed, although trace amounts may survive and be present in the exhaust at very low levels (parts per million)."

- a. Please provide an independent, third-party analysis of that supports that statement.

A-ARE-17: See Attachment ARE-16-1.

Interrogatory ARE-18

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-18: Referring to Petition page 22 and the statement therein: "Electrical energy generated by the Project will generate 980 lbs/MWh of CO₂."

- a. Please provide an independent, third-party analysis of that supports that statement.

A-ARE-18: See data table in Attachment ARE-16-1.

Interrogatory ARE-19

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-19: Referring to Petition page 22 and the statement therein: “average CO2 footprint of utility grid power, ...is 1,501 lbs CO2 per MWh (EPA EGRID 2016 (February 2018) US, nonbaseload). Consequently, the Project will generate 521 lbs/MWh less CO2—or approximately 19,169 fewer tons per year—than utility grid power.”

- a. Why is it appropriate to use EPA EGRID 2016, when ISO-New England reported in March 2021 that the average CO2 footprint of utility grid power was 633 lbs CO2 per MWh for 2019 and has been steadily declining? See https://www.iso-ne.com/staticassets/documents/2021/03/2019_air_emissions_report.pdf and

Table 1-1
2018 and 2019 ISO New England System Emissions (ktons)
and Emission Rates (lbs/MWh)

Annual System ^(a) Emissions						
	2018 Emissions (ktons)	2019 Emissions (ktons)	Change in Emissions (%)	2018 Emission Rate (lbs/MWh)	2019 Emission Rate (lbs/MWh)	Change in Emission Rate (%)
NO _x	15.61	12.87	-17.6	0.30	0.26	-13.3
SO ₂	4.96	2.34	-52.8	0.10	0.05	-50.0
CO ₂	34,096	30,997	-9.1	658	633	-3.8

(a) The term “system” refers to native generation here and throughout the report.

A-ARE-19: It is appropriate to use the U.S. non-baseload average CO2 emissions for comparison because a very significant portion of the power consumed in the ISO-NE region is imported from out of the region and because the 24/7/365 capable distributed, clean power producing fuel cell power plants are ideal for replacement of the power generated by older, higher-emitting non-baseload generators. More current EGRID Data is available and the U.S. non-baseload CO2 emission rate for 2019 is 1420.2 lb/MWh. The CO2 annual emission reduction for HFC1 using that figure is 16,196 tpy. See ISO-NE 2019 Emissions Report.

Interrogatory ARE-20

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-20: Admit that based upon the *2019 ISO-New England 2019 ISO New England Electric Generator Air Emissions Report (March 2021)*, the proposed project will generate at least 347 lbs/MWh more CO₂ than utility grid power in ISO-New England. If you deny, please explain in detail the basis for your denial.

A-ARE-20: FCE does not have the information necessary to respond to the question with a reasonable degree of accuracy.

Interrogatory ARE-21

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-21: Referring to Petition page 23 and the statement therein: "Prior to accessing the spent media, the vessel is inerted with nitrogen to allow safe access into the vessel. During this inertion process, a small volume of natural gas is vented to atmosphere."

- a. Exactly how much natural gas will be vented into the atmosphere?
- b. What is the maximum number of times during a year that this venting will occur?

A-ARE-21:

- a. The isolated gas within the vessel is approximately 110 standard cubic feet (approximately 5 lb) and is released to the atmosphere on purging out of service. Following media replacement approximately 300 cubic feet of gas would be released (approximately 13 lb) for the purging into service for the vessel.
- b. For the HFC1 site up to 3 media extractions per year are anticipated.

Interrogatory ARE-22

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-22: Referring to Petition page 23, how much benzene is released each year into the air and not captured by the solid waste media?

A-ARE-22: The quantity of benzene released to the air each year by passing through the desulfurization media and the fuel cells is estimated to be zero.

Interrogatory ARE-23

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-23: Referring to Petition page 23 and the statement therein: "The benzene, present in the natural gas in very low parts per million concentrations or less, is co-adsorbed onto the media along with the target sulfur compounds. The total waste generation quantity (media plus adsorbed sulfur compounds) during any single desulfurizer media replacement event is less than 2,000 pounds (900 kg) and previous operating experience throughout Connecticut suggests that desulfurizer maintenance events for any single fuel cell plant will be no more frequent than annually, and more likely less frequent than every two years (it varies, depending on the actual sulfur concentration in the gas locally)."

- a. What is the exact amount of benzene present in the natural gas in parts per million?
- b. What has been the maximum number of desulfurizer maintenance events within a single calendar year for a single fuel cell plant built by FCE?
- c. If all three of the fuel cells that comprise the Project have their media replacements in the same month, would the monthly waste exceed the range for generators that operate under the Small Quantity Generator rules?

A-ARE-23:

- a. The exact amount of benzene present in natural gas varies and is low. FuelCell Energy has established a maximum concentration specification limit of less than 10 ppmv for benzene in natural gas fuel for SureSource fuel cell plants.
- b. Two.
- c. Yes.

Interrogatory ARE-24

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

Petition No. 1458

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Q-ARE-24: Referring to Petition page 27 and the statement therein: “the Project will actually provide an environmental benefit to the State of Connecticut by reducing CO2 emissions by approximately 19,169 tpy as compared to utility grid power.”

- a. Please explain why that statement is not completely false in light of the *2019 ISO-New England 2019 ISO New England Electric Generator Air Emissions Report* (March 2021) referred to above.

A-ARE-24: It is not clear exactly what electric generation resources the power generated by the HFC1 fuel cell plant will displace, but it will likely not be wind, solar or nuclear. Far more likely is the prospect that the displaced generation resource will be far more polluting than a renewable resource and therefore something holding back the further lowering of the region’s overall emissions reduction. The displaced resources could be as high as the U.S. non-baseload average CO2 emission rate.

Interrogatory ARE-25

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-25: Do you agree the addition of CO2 emissions from the Project would pollute, impair or aid in destroying the air, water or other natural resources of the State of Connecticut? If not, please explain why not.

A-ARE-25: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-26

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-26: Do you agree that the area for the proposed Project is an environmental justice community? If not, please explain why not.

A-ARE-26: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-27

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-27: Do you agree that the residential area surrounding and affected by the proposed Project has one of the highest incidents of emergency room hospital visit rates for asthma in the State of Connecticut? If not, please explain why not.

A-ARE-27: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-28

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-28: Do you agree that the residential area surrounding and affected by the proposed Project has one of the highest incidents of hospitalizations for asthma in the State of Connecticut? If not, please explain why not.

A-ARE-28: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-29

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-29: Have you examined how a facility like the Project can affect communities that already have high rates of emergency room visits and hospitalizations for asthma? If not, please explain why not.

A-ARE-29: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-30

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-30: Do you agree that communities that experience high rates of emergency room visits and hospitalizations for asthma have justifiable safety concern with projects such as the Project? If not, please explain why not.

A-ARE-30: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-31

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-31: Do you agree with the statement: "Climate change poses an existential threat to humanity." William Tong, *State of Connecticut v. Exxon Mobil Corp.*, HHD-CV20- 6132568-S (Conn. Sup. Ct. filed Sept. 14, 2020) No. 100.31 at P1. If not, please explain why not.

A-ARE-31: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-32

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-32: Do you agree with the statement: Connecticut is already suffering from “sea level rise, flooding, drought, increases in extreme temperatures and severe storms, decreases in air quality, contamination of drinking water, increases in the spread of diseases, and severe economic consequences.” *Id.* at P17. If not, please explain why not.

A-ARE-32: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council’s review of the project and the approval sought by HFC1.

Interrogatory ARE-33

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-33: Do you agree with the statement: “[C]limate change will continue to have increasingly serious, life-threatening, and financially burdensome impacts on the people of Connecticut and the lands, waters, coastline, species, natural resources, critical ecosystems, infrastructure and other assets owned by the State and its political subdivisions.” *Id.* At P23. If not, please explain why not.

A-ARE-33: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council’s review of the project and the approval sought by HFC1.

Interrogatory ARE-34

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-34: Do you agree with the statement: "Credible scientific evidence indicates- especially considering recent extreme weather events-that the catastrophic effects of climate change are occurring sooner than anticipated." *Id.* at P172. If not, please explain why not.

A-ARE-34: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-35

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-35: Do you agree with the statement: "Climate change has negatively impacted, is negatively impacting, and will continue to negatively impact Connecticut's people, lands, waters, coastline, infrastructure, fish and wildlife, natural resources, critical ecosystems, and other assets owned by or held in the public trust by the state of Connecticut and/or its municipalities." *Id.* at 173. If not, please explain why not.

A-ARE-35: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-36

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-36: Do you agree with the statement: "Climate change has caused, is causing, and will cause sea level rise, flooding, drought, an increase in extreme temperatures, a decrease in air quality, an increase in severe storms, contamination of drinking water, and an increase in certain disease-transmitting species." *Id.* at 174. If not, please explain why not.

A-ARE-36: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-37

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-37: Do you agree with the statement: "As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause an increase in illness, infectious disease and death." *Id.* at 175. If not, please explain why not.

A-ARE-37: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-38

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-38: Do you agree with the statement: "As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause serious damage to existing infrastructure, including but not limited to coastal and inland development, roadways, railways, dams, water and sewer systems, and other utilities." *Id.* at 176. If not, please explain why not.

A-ARE-38: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-39

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-39: Do you agree with the statement: "As a result of the negative impacts on Connecticut's environment, climate change has caused, is causing, and will cause serious detrimental economic impacts on the State of Connecticut, its people, businesses and municipalities, including but not limited to heat-related productivity losses, increased energy cost and consumption, and agriculture, tourism, and recreation losses." *Id.* at 177. If not, please explain why not.

A-ARE-39: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-40

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-40: Do you agree with the following statement in the DEEP Brief regarding the Project: “bringing this project on line would increase carbon dioxide emissions when compared with the expected emissions from the grid over the next 20 years, causing Connecticut to backslide on its climate goals.” If not, please explain why not.

A-ARE-40: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council’s review of the project and the approval sought by HFC1.

Interrogatory ARE-41

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-41: Have you prepared or commissioned a report to look at the increased health risks, particularly to those with asthma, that the Project would impose upon nearby residents? If not, please explain why not. If yes, please provide a copy of such report(s).

A-ARE-41: HFC1 objects to this interrogatory because it seeks information that is not relevant and not likely to lead to the discovery of admissible evidence which will assist the Council's review of the project and the approval sought by HFC1.

Interrogatory ARE-42

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

Petition No. 1458

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Q-ARE-42: Will the presence of sulfur in the fuel cell process cause any odor during the operation and maintenance of the Plant? If not, please explain how sulphur does not emit odor to the surrounding areas?

A-ARE-42: No. The operation of the fuel cell plants is odorless. During the short duration (<2 hour) maintenance operation of removing the spent desulfurizer media, there is a very localized odor that is experienced by the maintenance workers, but it is mild enough that it does not carry offsite. The sulfur is very strongly bonded to the desulfurization media.

Interrogatory ARE-43

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

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Q-ARE-43: Dual-fuel (hydrogen and natural gas) projects are being constructed even in coal-friendly States for commercial operation in 2025 with a starting mix of 30% hydrogen. See, e.g., <https://www.bv.com/news/black-veatch-supporting-western-power-agency-first-hydrogencapable-combined-cycle-units>. Why is the Project not committing to use a minimum level of hydrogen as a fuel source?

A-ARE-43: The Project is not dual-fuel.

Interrogatory ARE-44

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-44: Will the Project participate in the ISO-NE market for ancillary services such as regulation, ten-minute synchronized reserves (TMSR), ten-minute non-synchronized reserve (TMNSR); and thirty-minute operating reserves (TMOR)? If not, explain why not. If yes, explain what ancillary services the Project will provide.

A-ARE-44: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state."

Interrogatory ARE-45

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-45: Will the Project participate in the ISO-NE forward capacity market? If so, commencing in what year?

A-ARE-45: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state."

Interrogatory ARE-46

Homestead Fuel Cell 1, LLC

Witness:

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Q-ARE-46: Do you contend that New England has inadequate capacity resources to meet demand? If yes, please explain. If not, please explain why the Project is necessary.

A-ARE-46: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state."

Interrogatory ARE-47

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-47: Please explain why the Project is necessary in light to the Siting Council's approval of the Killingly Energy Center ("KEC") in docket 470B.

A-ARE-47: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state."

Interrogatory ARE-48

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

Petition No. 1458

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Q-ARE-48: The Siting Council made a factual finding (number 120) in Docket 470B, order of June 6, 2019, that on a megawatt equivalent basis, a fuel cell project would result in far greater environmental impacts than the KEC. Do you dispute that finding? If so, please explain. If not, please explain why the Project is needed.

A-ARE-48: To be accurate, Finding of Fact 120 in Docket No. 470B says, "In addition to solar and wind, fuel cells are also considered a Class I renewable energy source in Connecticut per CGS § 16-1. Fuel cells were considered by NTE as an alternative but dismissed due to their lack of proven operation at a sufficiently large scale. For example, the 63.3 MW fuel cell facility approved by the Council in Petition No. 1184 was, at the time, among the largest fuel cell proposals in the world. Site impacts include about 13.7 acres of land and water consumption is approximately 300,000 gallons per day (gpd). For a fuel cell project to generate approximately 650 MW, would result in far greater impacts than KEC. (NTE 4, response 4, CGS § 16-1)."

Interrogatory ARE-49

Homestead Fuel Cell 1, LLC

Witness: Mark Benedict

Petition No. 1458

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Q-ARE-49: Please provide the annual quantity of each hazardous material that is expected to be generated by the Project.

A-ARE-49: For each of the three plants, approximately 900 Kg of spent desulfurizer media per year will be disposed of. It is possible that this waste stream may be characterized as RCRA hazardous, but, per recent experience, there is a very high likelihood that it will not, in which case it will be Connecticut regulated, CR05. Upon generation, it will be sampled and laboratory analyzed for a definitive determination. In total, the 3 plants would be expected to generate approximately 2700 Kg of spent desulfurizer media in a year.

For each of the three plants, the preconverter catalyst is replaced approximately every 3 years. The spent metal catalyst is shipped off site as a recyclable material. Each plant has approximately 1500 lb. of preconverter catalyst. The annualized quantity of spent preconverter catalyst shipped off site for the 3 plants is 1500 lb/year.

Interrogatory ARE-50

Homestead Fuel Cell 1, LLC

Witness:

Petition No. 1458

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Q-ARE-50: Referring to A-CSC-24, please provide the proposed plan or plans that show the location of the new upgraded pipeline.

A-ARE-50: The basis of Allco's request for participant status in this proceeding was CGS Section 22a-19(a)(1) that provides, in part, "In any administrative, licensing or other proceeding ... any person ... may intervene as a party on the filing of a verified pleading asserting that the proceeding or action for judicial review involves conduct which has, or which is reasonably likely to have, the effect of unreasonably polluting, impairing or destroying the public trust in the air, water or other natural resources of the state." HFC1 objects to this interrogatory since it is not related to the Project's potential impact on air, water or natural resources of the state."



FuelCell Energy

TEST REPORT

California Environmental Protection Agency Air Resources Board (ARB/CARB) Distributed Generation (DG) Certification Program DFC3000 (2.8 MW)

PREPARED FOR: FUELCELL ENERGY, INC
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Danbury, CT 06810

Contact Name: Mark Benedict, P.E.
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PREPARED BY: AIR TOX ENVIRONMENTAL COMPANY, INC.
479 Tolland Turnpike
Willington, Connecticut 06279

Contact Name: Eric Dithrich, QSTI
Vice President, Emissions Monitoring Services
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Air Tox Project No. 10025

July 2010

The gas sampling traverse points were determined according to the guidelines given in ARB Methods 1 and 2 for velocity traverses. Multipoint gas sampling demonstrated that the mean diluents (O₂) concentration was less than 10% different from that at any single point. The stratification check used the eight traverse points per port for a total of sixteen points. A single point that best represented the mean concentration during the check was used for the duration of the test program. The RM sampling probe was traversed at the points listed below in Table 2-2:

**TABLE 2-2
STRATIFICATION CHECK TRAVERSE POINTS
ACROSS THE EXHAUST STACK DIAMETER (28 inches)**

Traverse Point	Percentage Across Diameter	Distance (in.)
1	3.2%	0.9
2	10.5%	2.9
3	19.4%	5.4
4	32.3%	9.0
5	67.7%	19.0
6	80.6%	22.6
7	89.5%	25.1
8	96.8%	27.1

2.2 Results of the Sampling Program

Three (3) one-hour NO_x, CO and VOC test runs (nominal) were performed at the exhaust stack DFC[®]3000 (2.8 MW) on July 14, 2010 between the hours of 11:10 – 15:21hrs. Results from the NO_x, CO and VOC sample analysis are reported in the units of pounds per megawatt hour (lb/MW-hr). The average emission rates for NO_x, CO and VOC determined during this test program demonstrate compliance with the emission limits of 0.07, 0.10, and 0.02 lb/MW-hr, respectively. A summary of the results is presented below in Table 2-3.

**TABLE 2-3
EMISSION DATA SUMMARY
FCE DFC[®]3000 (2.8 MW) PLANT
JULY 14, 2010**

PARAMETERS	UNITS	TEST RUN NO. 1	TEST RUN NO. 2	TEST RUN NO. 3	AVERAGE
Time	-	11:10-12:10	12:48-13:48	14:21-15:21	-
Flow Rate	DSCFM	9,034	9,092	9,080	9,069
Temperature	°F	752	756	758	755
Moisture	%	15.4	15.3	15.0	15.3
O ₂	%	12.4	12.5	12.5	12.4
CO ₂	%	4.0	4.2	4.3	4.2
Net Power	MW-hr	2.740	2.732	2.722	2.731
NO _x Emission Rate	lb/MW-hr	0.008	0.006	0.005	0.006
CO Emission Rate	lb/MW-hr	0.01	0.01	0.02	0.01
VOC Emission Rate	lb/MW-hr	0.02	0.02	0.02	0.02