



FuelCell Energy

Ultra-Clean, Efficient, Reliable Power

August 17, 2016

**VIA EMAIL AND U.S. MAIL**

Ms. Melanie A. Bachman  
Acting Executive Director  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

**PETITION NO. 1248** - TRS Fuel Cell, LLC petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the construction, maintenance, and operation of a 3.7 megawatt combined heat and power fuel cell facility to be located at 64 Triangle Street, Danbury, Connecticut

Dear Ms. Bachman:

Enclosed please find an original and fifteen copies of TRS Fuel Cell, LLC's ("TRS") responses to the Connecticut Siting Council's (the "Council") Interrogatories dated August 12, 2016 in the above-captioned proceeding.

TRS wishes to also advise the Council of a slight modification to some of the design characteristics of the proposed project as compared to the original submission. Subsequent to further study by the development team and discussions with the City of Danbury, TRS proposes to replace the existing berm and overgrown chain link fencing that surrounds the property with various landscaping improvements, including adding an ornamental fence and an access drive on the Northwestern perimeter of the property. These changes require that the access drive be moved to the center of the property and that the fuel cell project power block be rotated 90-degrees. A modified drawing reflecting these proposed changes is enclosed herewith for the Council's review and consideration. As is customary, TRS will provide final construction drawings prior to the commencement of construction at the site.

Please feel free to contact me if you have any questions with respect to the foregoing or the enclosed.

Respectfully submitted,  
FUELCELL ENERGY, INC., sole member of  
TRS FUEL CELL, LLC

Jennifer D. Arasimowicz  
Vice President, Managing Counsel

Encl.

Interrogatory CSC-1

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-1 The proposed facility would deliver electrical power directly to a “nearby substation.” What is the voltage of the substation?

A-CSC-1 The proposed facility would deliver electrical power to the existing 13.8kV distribution circuit 0.2 miles from the Triangle Street substation.

Interrogatory CSC-2

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-2 How would the generated power from the facility get to the substation? Does Eversource currently have a three-phase electrical distribution line in the area?

A-CSC-2 The generated power would be transmitted to the substation through the utilities 15kV transformer. The utility has a distribution line in the area.

Interrogatory CSC-3

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-3 Is a System Impact Study required for the interconnection process? Does the Petitioner have an Interconnection Agreement with Eversource?

A-CSC-3 An impact study is required. FCE has applied for an electrical interconnect agreement with Eversource.

Interrogatory CSC-4

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-4 Are gas and power lines already available at the location of the proposed facility? Please describe the routing of these connections.

A-CSC-4 Gas and power are in the area but additional underground infrastructure is new for the location.

Interrogatory CSC-5

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-5 What is the height above ground level of the tallest structure or equipment in the project footprint? What are the heights of the proposed stacks?

A-CSC-5 The height above ground level of the tallest structure is approximately 27 feet. The height of the exhaust stack will be 30 feet or less.

Interrogatory CSC-6

TRS Fuel Cell, LLC

Witness: N/A

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Q-CSC-6 Has the Petitioner received a written response from the State Historic Preservation Office regarding the Project Review Cover Form that was submitted? If so, please provide a copy of such response.

A-CSC-6 Yes. A copy of the response was filed with the Council on August 16, 2016.

Interrogatory CSC-7

TRS Fuel Cell, LLC

Witness: Kirk Arneson

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Q-CSC-7 If approved, approximately when would construction commence and what would be the estimated in-service date for the project?

A-CSC-7 Construction on the project is scheduled to start February, 2017. It is estimated that the fuel cell will go online July, 2017.



Interrogatory CSC-8

TRS Fuel Cell, LLC

Witness: Kirk Arneson

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Q-CSC-8 What is the proposed mesh size of the fence? Would the Petitioner be willing to consider the installation of an anti-climb fence with less than two-inch mesh or other deterrent?

A-CSC-8 While FCE is willing to accommodate a 1" mesh size, FCE is aware that the City of Danbury may want to provide input into the aesthetics of the fencing. Therefore, FCE respectfully suggests collaborating with the City to determine a mutually agreeable fencing specification and provide that to the Council for its review and consideration.

Interrogatory CSC-9

TRS Fuel Cell, LLC

Witness: Kirk Arneson

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Q-CSC-9 Would any vegetative clearing and grading be required for the installation of the proposed facility?

A-CSC-9 No. The area affected by the fuel cell installation is currently being used as a storage facility and parking lot. The vast majority of the affected area is pavement and compacted stone. Minor grass and weed removal will be required, but no overgrowth or trees will be removed.

Q-CSC-10 Page 5 of the Petition mentions liquid nitrogen that would be stored on site. What would that liquid nitrogen be used for?

A-CSC-10 Nitrogen is only used for storage of the fuel cells or during an upset condition. Normal operation of the fuel cells does not require nitrogen. The electro chemical process used by the fuel cells to convert hydrogen and oxygen to electricity, heat and water is sensitive to humidity. During normal operation, natural gas is humidified using purified potable water. At the elevated temperatures at which the fuel cells normally operate, such humidity is not a problem. However, during a shutdown, if the humid mixture begins to cool and condense, it could negatively impact the expected life and performance of the fuel cells. Similarly, natural humidity associated with the atmosphere could negatively impact the fuel cells. In an upset condition or during storage, nitrogen is used to purge the fuel cell modules of all humidified natural gas and prevent ambient air intrusion. The nitrogen is used in the gaseous form, but stored in the liquid form for ease of transport and to minimize storage space.

Interrogatory CSC-11

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-11 Would the proposed fuel cell shut down in the event of a power outage, and if so, does it have "black start" capability and the ability to automatically restart?

A-CSC-11 The fuel cell will shut down in the event of a power outage. It is equipped with a utility-specified UL certified protective relay and is capable of starting remotely. The fuel cell's control system is designed to allow the system to "fail safe" in the event of a process upset.

Interrogatory CSC-12

TRS Fuel Cell, LLC

Witness: Kirk Arneson

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Q-CSC-12 Please identify media to be used for pipe cleaning procedures at the proposed facility in accordance with Public Act 11-101, An Act Adopting Certain Safety Recommendations of the Thomas Commission.

A-CSC-12 A clean rag will be drawn through the pipe multiple times to ensure there is not construction debris or foreign matter remaining in the pipe. Air will then be used to blow out any remaining dust.

Interrogatory CSC-13

TRS Fuel Cell, LLC

Witness: Kirk Arneson

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Q-CSC-13 Would bollards be used to protect the fuel cell facility from being accidentally struck by vehicles?

A-CSC-13 Yes. Bollards will be used to protect the fuel cell facility.

Interrogatory CSC-14

TRS Fuel Cell, LLC

Witness: N/A (calls for legal conclusion)

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Q-CSC-14 What statutes and/or regulations govern fuel cell emissions for the proposed facility?

A-CSC-14 Section 22a-174-3a of the Regulations of Connecticut State Agencies identifies those facilities that are required to obtain an air permit from the Connecticut Department of Energy and Environmental Protection. The potential emissions from the proposed installation at the Triangle Street project are below the regulation's applicability threshold, and therefore an air permit is not required.

Interrogatory CSC-15

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-15 Provide a table showing state criteria thresholds and projected emissions from the proposed facility for all greenhouse gas emissions listed in the Regulations of Connecticut State Agencies Section 22a-174-1(49). Please provide the response in pounds per megawatt hour.

A-CSC-15 The criteria threshold for greenhouse gases is new stationary sources that emit, or has the potential to emit, equal to or greater than 100,000 tons/year of CO<sub>2</sub>e and one hundred (100) tons per year of greenhouse gases.

Greenhouse Gas	State of CT Criteria Thresholds for GHGs <i>(applicability requires <b>both</b> thresholds be exceeded)</i>		Facility Projected Emissions		
	(tpy equivalent to 100,000 tpy CO <sub>2</sub> -e)	(tpy GHG)	(tpy CO <sub>2</sub> -e)	(tpy GHG)	(Lb/MWh)
Carbon Dioxide (CO <sub>2</sub> ) (GWP =1)	100,000	100	11,750	11,750	725
Methane (CH <sub>4</sub> ) (GWP=23)	4,348	100	17	0.7	0.04
Nitrous Oxide (N <sub>2</sub> O) (GWP = 296)	337	100	0	0	0
Sulfur Hexafluoride (SF <sub>6</sub> ) (GWP = 22,200)	4.5	100	0	0	0
Any Hydrofluorocarbon (HFC) (GWP varies)	Varies; (8 – 8,333)	100	0	0	0
Any Perfluorocarbon (PFC) (GWP varies)	Varies; (4.5 – 18)	100	0	0	0
<b>Total CO<sub>2</sub>-e &amp; GHG</b>	<b>100,000</b>	<b>100</b>	<b>11,767</b>	<b>11751</b>	<b>N/A</b>



Interrogatory CSC-16

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-16 Provide a comparison of carbon dioxide emissions for the proposed facility in pounds per megawatt hour with waste heat recovery and without waste heat recovery.

A-CSC-16 Carbon dioxide emissions from the proposed facility will be 725 lb/MW-hr without waste heat recovery. The project also has heat recovery to provide hot water to the host facility for comfort heating. The maximum heat recovery duty during winter months will be approximately 300,00 Btu/hr, at which time the equivalent carbon dioxide emissions would be 708 lb/MW-hr. See also response to CSC-17.

Interrogatory CSC-17

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-17 Provide information regarding available technologies to reduce greenhouse gas emissions from the proposed facility.

A-CSC-17 The fuel cell itself is considered by many to be the best available control technology on a baseload, non-intermittent basis to reduce greenhouse gas emissions from distributed or grid-provided generation to the facility. The proposed fuel cell project is projected to reduce carbon dioxide emissions by 6,191 tons per year, which is almost a 35% reduction versus current carbon dioxide emissions associated with the grid. Carbon dioxide emissions are inversely related to fuel efficiency. By virtue of the high electrical efficiency of the proposed project, it already has a very low carbon dioxide emissions factor. Additional heat recovery for this proposed High Efficiency Fuel Cell project is not practical.

Interrogatory CSC-18

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-18 Could offsets be used to mitigate air emissions impacts from the facility?

A-CSC-18 Yes.

- Q-CSC-19 Discuss other mitigation techniques that could be used to offset air emissions from the proposed facility e.g. planting trees. If planting trees is listed as an option, estimate the number and size of trees required.
- A-CSC-19 The fuel cell itself is being used to offset the air emissions of the typical and traditional methods of power generation supporting the electrical distribution system. The fuel cell power plant will generate 3.7 MW of power that would otherwise be supplied from the distribution grid. Criteria emissions from the proposed fuel cell project are minimal (as such no air permit is required) and CO<sub>2</sub> emissions are substantially below the current emissions resulting from grid power use. Due to the proposed project's high overall efficiency, it will actually reduce CO<sub>2</sub> emissions by 6,191 tons per year over the current utilization of grid power. The amount of carbon dioxide absorbed by trees varies widely, however one quoted figure is 2.6 tons of CO<sub>2</sub> absorbed per year per acre of hardwood trees (see <https://www.ncsu.edu/project/treesofstrength/benefits.htm>.) Using this carbon dioxide uptake value, calculations estimate that the operation of the proposed fuel cell project itself is equivalent to the planting of 2400 acres ( 3.7 square miles) of trees.

Interrogatory CSC-20

TRS Fuel Cell, LLC

Witness: Lou Ernst

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Q-CSC-20 Other than the initial startup, what other factors would require a startup of the facility as referred to on pages 11 and 12 of the petition? Does a startup typically take four days?

A-CSC-20 There are no additional factors requiring startup. Commissioning of the fuel cell takes approximately one month.

Q-CSC-21 Please submit a desulfurization plan narrative for the proposed fuel cell facility containing the following information:

- a) Chemical reaction overview concerning what substances are produced from the desulfurization process, as well as plans for their containment and transport;
- b) How much solid sulfur oxide would result from the desulfurization process, and methods and locations for containment, transport, and disposal;
- c) Whether any of these desulfurization substances are considered hazardous, and if so, plans for the containment, transport, and disposal of hazardous substances;
- d) Anticipated method of disposal for any other desulfurization substances; and
- e) Whether any gaseous substances resulting from desulfurization can be expected to vent from the fuel cells, as well as the applicable DEEP limits regarding discharge of these gasses.

A-CSC-21 The fuel cell stacks that generate the electric power can be fouled by the sulfur odorant compounds (primarily mercaptans and/or sulfides) that the gas utility company injects into the natural gas. Accordingly, the fuel cell plant incorporates a desulfurization process that consists of two flow-through vessels configured in series filled with a specialized, proprietary desulfurization adsorption media. The sulfur removal mechanism is a physical adsorption or chemisorption process wherein the sulfur atoms are captured by the granular solid media without the release (production) of any other chemical species. In the process of removing the sulfur compounds from the gas, the capacity of the media for continued sulfur removal is diminished up until the point when it becomes exhausted and, if the media is not changed, sulfur break through would occur. At this point the media is deemed to be "spent." When the spent media in the lead desulfurizer vessel needs to be replaced, the fuel gas process flow is switched to the lag vessel only so that the spent media can then be removed from the off-line vessel and replaced with fresh media. 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. After media replacement and once the vessel containing the fresh media has been inerted and purged into service, it then serves as the second (polishing) desulfurizer vessel in the process flow series.

The spent solid waste media removed from the process has been characterized at similar locations to be RCRA hazardous by toxicity characteristic for benzene (D018). 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 2000 pounds (900 kg) and previous operating experience throughout Connecticut suggests that desulfurizer maintenance events 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). The monthly waste generation rate is within the range for generators that operate under Small Quantity Generator rules. TRS Fuel Cell, LLC, as plant owner/operator, will comply with all rules for hazardous waste generators as promulgated through the regulations at Regulations Connecticut State Agencies § 22a-449(c).

The waste generated when removing the spent desulfurizer media from the process is managed by immediately containerizing and transporting the waste off-site to a licensed disposal facility. Waste will not be treated, stored or disposed of at the site. The containerized waste is shipped off-site under a Uniform Hazardous Waste Manifest under the generator's EPA RCRA identification number. A licensed hazardous waste transporter under contract to FuelCell Energy, Inc., as service provider for the fuel cell project (e.g. Clean Harbors, Triumvirate, Miller Environmental), will be contracted to pick up the waste and transport it to an approved designated disposal facility. The licensed waste destination facility will be determined at the time of contracting the waste contractor firm.

TRS Fuel Cell, LLC  
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 August 17, 2016

ZONING INFORMATION TABLE	
ZONE: I-40	USE: OFFICE, WAREHOUSE, OUTDOOR STORAGE OF COMBAT EQUIP., & COMMERCIAL PROFESSIONAL OFFICE FACILITY
	- REMOTE ACCESSIBLE USE
ZONE DETAILS	REQUIREMENTS
MINIMUM LOT AREA (S.F.) MINIMUM LOT WIDTH (FEET) MINIMUM FRONT YARD SETBACK (FEET) MINIMUM SIDE YARD SETBACK (FEET) MINIMUM REAR YARD SETBACK (FEET) MINIMUM BUILDING HEIGHT (FEET) MINIMUM OPEN SPACE PERCENTAGE	MINIMUM LOT AREA (S.F.) MINIMUM LOT WIDTH (FEET) MINIMUM FRONT YARD SETBACK (FEET) MINIMUM SIDE YARD SETBACK (FEET) MINIMUM REAR YARD SETBACK (FEET) MINIMUM BUILDING HEIGHT (FEET) MINIMUM OPEN SPACE PERCENTAGE
40,000 30 20 10 5 35	40,000 30 20 10 5 35
- SITES EXISTING IN CONFORMANCE WITH THE ZONING REGULATIONS	

PARKING INFORMATION TABLE	
1) OFFICE (MAXIMUM 1.5 SPACES PER 1,000 S.F. OF OFFICE)	40 SPACES
2) WAREHOUSE (MAXIMUM 1.0 SPACES PER 1,000 S.F. OF WAREHOUSE)	9 SPACES
3) LOADING SPACES (MAXIMUM 1.0 SPACES PER 1,000 S.F. OF LOADING SPACE)	9 SPACES
4) TOTAL REQUIRED PARKING	49 SPACES
5) TOTAL PROVIDED PARKING	70 SPACES
6) UNASSIGNED ACCESSIBLE PARKING (REQUIRED)	1 SPACES
7) LOADING SPACES PROVIDED	1,000 S.F.
8) LOADING SPACES REQUIRED	1,000 S.F.

VEHICLE TRIP ESTIMATE	
1) OFFICE (MAXIMUM 1.5 SPACES PER 1,000 S.F. OF OFFICE)	108 TRIPS
2) WAREHOUSE (MAXIMUM 1.0 SPACES PER 1,000 S.F. OF WAREHOUSE)	20 TRIPS
3) LOADING SPACES (MAXIMUM 1.0 SPACES PER 1,000 S.F. OF LOADING SPACE)	0 TRIPS
4) TOTAL VEHICLE TRIPS	128 TRIPS

**LEGEND**

- PROPOSED TRAFFIC PATTERN
- PROPOSED TRAFFIC SIGNAL
- PROPOSED SIGN
- PROPOSED TREE
- PROPOSED LANDSCAPING
- PROPOSED BIKEWAY
- PROPOSED BIKEWAY SIGN
- PROPOSED BIKEWAY LIGHTING
- PROPOSED BIKEWAY CROSSING
- PROPOSED BIKEWAY CROSSING SIGN
- PROPOSED BIKEWAY CROSSING LIGHTING
- PROPOSED BIKEWAY CROSSING SIGN AND LIGHTING
- PROPOSED BIKEWAY CROSSING SIGN AND LIGHTING WITH BIKEWAY CROSSING LIGHTING
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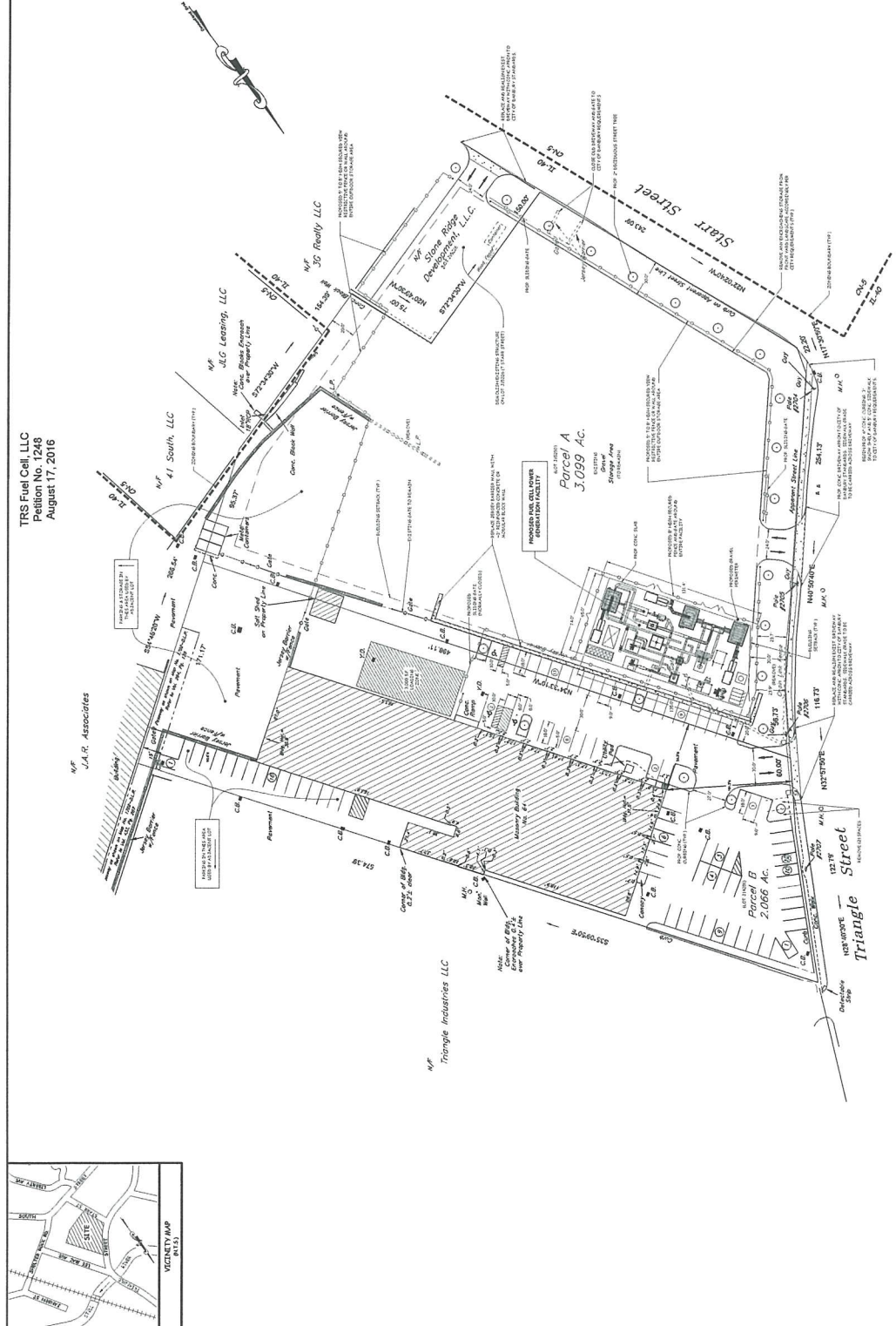
REVISED	DATE	BY
1	08/10/2016	J.A.R.

FUEL CELL ENERGY / J.A.R. ASSOCIATES  
 64 TRIANGLE STREET  
 DANBURY, CONNECTICUT

SCALE: 1" = 40'  
 DATE: August 10, 2016  
 DRAWN BY: DWJ  
 APPROVED BY: DWJ

CONCEPTUAL SITE PLAN #2

Benjamin V. Doto, III, P.E., LLC  
 248 Main St., Suite 3A, Danbury, CT 06810  
 DRAWING NUMBER:  
 CP-02



0 10 20 30 40  
 SCALE: 1" = 40'

- CONCEPTUAL PLAN NOTES**
- THIS PLAN IS CONCEPTUAL IN NATURE AND IS NOT BE USED FOR REGULATORY PLANNING PURPOSES ONLY. ADDITIONAL DENSITY, HEIGHT, AND SETBACK REQUIREMENTS WILL BE REQUIRED PRIOR TO SUBMISSION OF DETAILED PLANS FOR LAND USE APPROVAL.
  - IT IS THE OWNER'S RESPONSIBILITY TO OBTAIN ALL NECESSARY PERMITS PRIOR TO THE START OF CONSTRUCTION.
  - THE CONTRACTOR IS TO CONTACT THE LOCAL PUBLIC UTILITIES (P.U.) PRIOR TO THE START OF CONSTRUCTION.
  - BOUNDARY AND TOPOGRAPHIC INFORMATION TAKEN FROM ELECTRONIC FILE PROVIDED BY NEW ENGLAND AND SHAWMUT, DECEMBER 2014.
  - THE PLAN IS BASED ON AERIAL PHOTOGRAPHS AND FIELD SURVEY DATA. ADDITIONAL SURVEY DATA, BOUNDARY AND ELEVATION DATA WILL BE REQUIRED PRIOR TO SUBMITTING CONCEPTUAL PLAN AND ACCESSIBLE ROUTE.
  - ANY NEW SIGNAGE AND LIGHTING ARE TO CONFORM TO THE CITY OF DANBURY ZONING REGULATIONS.
  - A FURTHER LANDSCAPE PLAN WILL BE REQUIRED TO COMPLY WITH THE CITY'S ZONING REGULATIONS.
  - ALL WORK WITHIN THE CITY RIGHT-OF-WAY IS TO BE REVIEWED AND APPROVED BY THE CITY OF DANBURY HIGHWAY DEPARTMENT.

OWNER OF RECORD  
 J.A.R. ASSOCIATES  
 64 TRIANGLE STREET, L.L.C.  
 DANBURY, CT 06810

APPROVED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_