HINCKLEY ALLEN

100 Westminster Street, Suite 1500
Providence, RI 02903-2319
p: 401-274-2000 f: 401-277-9600
hinckleyallen.com

Gerald J. Petros
gpetros@hinckleyallen.com

July 31, 2015

Patricia Lucarelli, Coordinator
Chief of Legal Services
RI Energy Facility Siting Board
89 Jefferson Boulevard
Warwick, Rhode Island 02888

Re: Proposed Upgrades to the Tiverton Power Facility
304 Progress Road, Tiverton, Rhode Island

Dear Ms. Lucarelli:

On behalf of Tiverton Power LLC, we are submitting this letter to the Energy Facility Siting Board ("EFSB") to describe proposed incremental upgrades the company plans to make to the combustion turbine at its nominal 265-megawatt combined cycle electric generation facility in Tiverton, Rhode Island (the "facility"), and to explain why we do not believe these upgrades constitute an "alteration" pursuant to R.I.G.L. § 42-98-3(d) such that a license is required from the EFSB.

The Energy Facility Siting Act, R.I.G.L. § 42-98-4, requires that an "alteration" to a "major energy facility" must first obtain a license from the EFSB. Because the facility's capacity is greater than 40 MW, it is a "major energy facility" under R.I.G.L. §42-98-3(d), and subject to EFSB's jurisdiction. "Alteration" is defined under the Act as:

> a significant modification to a major energy facility, which, as determined by the board, will result in a significant impact on the environment, or the public health, safety, and welfare. Conversion from one type of fuel to another shall not be considered to be an 'alteration.'

As explained in detail below, the proposed upgrades to the facility's combustion turbine are not a significant modification to the facility, and they will not result in a "significant impact" on either the environment, or public health and safety. The upgrades are designed to take advantage of the significant improvements in metallurgy and turbine design since the facility was constructed in 2000, and to improve the thermal performance of the turbine. These upgrades will result in an actual decrease of certain air pollutant emissions, while increasing the power output of the

facility. We respectfully request that the EFSB review the details of these upgrades and determine that no EFSB review or license is required.

Tiverton Power Facility Description and Setting

Tiverton Power LLC (a subsidiary of Emera Energy of Halifax, Nova Scotia), is the owner and operator of this nominal 265-megawatt (MW) combined cycle electric generating facility. The facility is located approximately two miles inland from the Sakonnet River, and ten miles inland from Rhode Island Sound. The facility is the sole occupant of the Tiverton Industrial Park, which is located off Route 24 in North Tiverton. It is somewhat isolated, and the nearest occupied structure is approximately one-half mile away.

The primary equipment at the facility consists of one GE Frame 7FA combustion turbine, one heat recovery steam generator (HRSG), and one steam turbine. The steam turbine utilizes an air cooled condenser, and there is no cooling tower associated with the steam turbine. There are two small cooling towers serving the combustion turbine cooling system and the combustion turbine inlet air cooling system. The facility also includes a gas compression system to increase the pressure of the fuel gas from pipeline pressure to the level required by the turbine, as well as an ammonia refrigeration system to provide inlet air cooling to improve warm weather performance.

The facility uses process water for makeup to the cooling systems for the combustion turbine, and inlet air to provide makeup for steam losses. Because the facility uses an air cooled condenser for the steam turbine, water usage at the facility is relatively low compared to many combined cycle power plants. Water is supplied by the North Tiverton Fire District. The facility has a zero discharge treatment system for process wastewater; therefore, no process wastewater is discharged from the facility. Sanitary wastewater discharges to an onsite system.

The combustion turbine is fired by natural gas. It is not permitted to fire any other fuel. There is no supplemental firing, and steam is generated in the HRSG solely with waste heat from the turbine. The combustion turbine is equipped with selective catalytic reduction to control nitrogen oxides (NO_X) emissions. The facility also has a diesel fire pump.

Description of the Proposed Upgrades

In conjunction with a planned routine maintenance outage in the spring or fall of 2016, Tiverton Power is planning the following upgrades to the facility:

1. The Advanced Gas Path (AGP) upgrade, which involves upgrading certain turbine components with materials that can withstand higher operating temperatures and changes to the cooling flow, so that less air is used for equipment cooling. This will result in a larger amount of air being available for generating power in the turbine. The AGP would improve the turbine heat rate (i.e., thermal efficiency) from 1.5 to 6.0 percent, depending on load and ambient conditions, and would increase the overall turbine power output.

2. The .04 Flared Compressor upgrade, which involves replacing numerous compressor components to allow higher mass flow through the turbine and HRSG. This will increase the maximum heat input to the turbine, and increase the electric output from both the combustion turbine and the steam turbine.

3. The DLN2.6+ Combustion System upgrade, which will result in lower NO_X generation by the combustor, and will improve low load emissions performance.

4. Combustion control system (Mark VI) with Continuous Dynamic Monitoring and real time turbine tuning upgrade, which will be installed by the system vendor, General Electric, as part of the package of installing the three upgrades listed above.

In addition to these upgrades to the turbine, and in order to accommodate the higher fuel flow, Tiverton Power expects to increase the size of the fuel compressor cylinders located inside the plant, as well as the cold gas scrubber, fuel gas coalescer, fuel gas heater, and the coil on the inlet air chiller (to accommodate the higher flow of air to the turbine[1]). Other than the possibility of increasing the size of the cold gas scrubber equipment pad, there will be no disturbance of soil during the project and no significant earthwork.

Tiverton Power also does not anticipate any changes to the electric transmission line or gas pipeline serving the facility as a result of these upgrades.

In performing these upgrades, Tiverton Power can take advantage of advances in turbine design with minimal plant disruption. The upgrades will be performed in conjunction with a scheduled maintenance shutdown. These upgrades are expected to increase overall plant thermal efficiency by 1 to 2 percent in the combined cycle mode[2] and increase maximum power output by up to 10 percent, depending on load conditions. Maximum post-control NO_X emissions will be reduced by about 17 percent (2.9 parts per million by volume dry (ppmvd), 24-hour average, after control, versus 3.5 ppmvd under the current permit) as a result of the lower NO_X emissions from the turbine. The nominal plant rating at International Organization for Standardization (ISO) conditions is expected to increase from 265 MW to about 287 MW. In addition, the facility is seeking to increase the maximum heat input rate allowed under its air permit to correspond to an ambient temperature of 0° F. The current heat input limit in the air permit was based on 20° F, and the facility currently cannot run at full capacity during periods when ambient temperatures are less than 20° F.

Benefits Resulting from the Upgrades

The proposed upgrades will improve the performance and operating flexibility of the Tiverton Power facility. Electric markets have changed dramatically since the facility was constructed. Though the facility was not originally constructed with the intent of cycling the plant based on

[1] The coil on the inlet air chiller is undersized for the facility and would likely be replaced even in the absence of this project.

[2] Thermal efficiency improvement in the combined cycle mode is much less than in the turbine alone because most of the waste heat is recovered in the HRSG and used to generate additional electricity in the steam turbine.

electric demand, it still must have flexibility to meet the needs of the electric grid. The proposed upgrades will allow the facility to be operated at lower loads due to improved load low emissions performance. In addition, the upgrades will allow the plant to produce approximately 10 percent more power during high demand periods. This increase in operating flexibility contributes to greater reliability and lower cost to the electric grid, and thus enhances public welfare.

In addition to these direct benefits to the electric grid, the project will reduce greenhouse gas emissions and other emissions per unit of electricity generated due to the improved turbine heat rate, and will significantly reduce NO_X emissions at all load levels due to the improved combustor design.

Required Permits and Approvals for the Upgrades

RIDEM Minor Source Air Pre-Construction Permit:

In order to implement these upgrades, Tiverton Power will need to obtain a minor source pre-construction air permit from the Rhode Island Department of Environmental Management's Office of Air Resources as required by Rhode Island Air Pollution Control ("RIPAC") Regulation No. 9. As part of this permit application, Tiverton Power has already performed the required air quality dispersion modeling to assess the ambient impacts of the Tiverton facility. This modeling showed that the facility will be in compliance with all applicable ambient air standard standards. Because the Tiverton facility is fired solely by natural gas, deposition of metals contained in the fuel is not a concern, and deposition modeling is not required as part of the air permitting process.

CRMC Assent:

Even though the facility is located at an inland location, a power generating facility with a generating capacity of greater than 40 MW may require an Assent from the Coastal Resources Management Council (CRMC) if the project is judged to impact the coastal environment. Tiverton Power is requesting a project review by CRMC to determine if CRMC Assent will be required, but we do not expect it to be required.

ISO-NE:

In accordance with the requirements of ISO-NE, Tiverton Power has filed a request to perform an interconnect study; however, the project is not expected to require any changes to electric transmission lines.

FERC:

Electric generating facilities (with the exception of hydropower facilities) are not subject to the jurisdiction of the Federal Energy Regulatory Commission (FERC) and the proposed upgrades will not require the alteration of the gas or electric transmission lines. Therefore, FERC approval

is not required. As neither FERC nor any other federal approvals will be required, coastal zone consistency for a federal action also does not apply to the proposed upgrades.

Environmental Impacts of the Proposed Upgrades

The environmental impacts of the project will be minimal. With the exception of a possible increase in the size of one outside equipment pad associated with the cold gas scrubber, there will be no excavation or earthwork on the facility property. There will be no increase in or significant change to the facility's footprint or boundaries. Since there will be no increase in the number of permanent employees, there will be no increase in sanitary wastewater discharge. The facility has a zero discharge system for process wastewater, and therefore there will be no process wastewater discharge associated with the upgrades.

The proposed upgrades will not have a significant impact on ambient noise levels, as all of the moving equipment associated with the upgrade is located inside the building. Furthermore, since the facility is the sole occupant of the Tiverton Industrial Park, and the nearest occupied structure is approximately one-half mile away, there are no adjacent residents or businesses to be impacted by any noise.

The proposed upgrades will increase water usage at the facility, but by less than 10 percent. Water usage at the facility fluctuates with electric output. In 2014, when it operated at approximately at 67 percent of its capacity, the facility's average water usage was 0.044 million gallons per day (mgd). In its Water Supply System Management Plan updated in October 2014, Tiverton Power's water supplier, the North Tiverton Fire District, indicated that its available water supply (based on its contracts with the Stone Bridge Fire District and the City of Fall River[3]) is 1.30 mgd, and its projected 2030 water demand is 0.61 mgd, which is less than half the available resource. Assuming a future generating capacity utilization of 95 percent, the maximum potential water usage after the proposed turbine upgrade is 0.068 mgd or less, well within the available capacity of the North Tiverton Fire District.

The air quality impacts of the proposed turbine upgrade will be minimal. The turbine upgrades will result in increased thermal efficiency, causing the emissions of all air pollutants (including greenhouse gases) to decrease slightly on a pound per megawatt-hour (lb/MW-hr) produced basis. NO_X emissions will also be reduced at all load levels. The maximum hourly emission rates of carbon monoxide (CO), and inhalable particulate matter (PM_{10} and $PM_{2.5}$) will not increase despite the increase in the maximum fuel firing rate. Also, to keep the upgrades emissions below certain air pollution regulatory thresholds, the maximum annual emissions will be limited to reflect the annual average firing rates (maximum firing rate varies with ambient temperature) and capacity utilization.

As referenced above, Tiverton Power performed air quality dispersion modeling in support of its RIAPC Reg. No. 9 minor air permit. The modeling shows that the Tiverton Power facility will

[3] North Tiverton Fire District purchases all of its water and does not have its own water supplies. The Stone Bridge Fire District obtains water from Stafford Pond and the City of Fall River obtains water from North Watuppa Pond.

be in compliance with the Clean Air Act's National Ambient Air Quality Standards, the Prevention of Significant Deterioration allowable increments, and Ambient Air Limits under RIAPC Reg. No. 22. The results of the modeling, and the comparison against applicable standards, are presented in **Tables 1 – 3**.

Conclusion

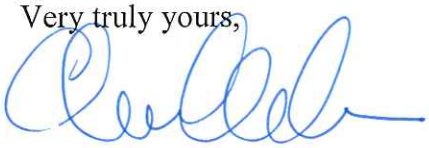
As explained above, the proposed turbine upgrades that Tiverton Power plans for its facility will:

- Improve the operational flexibility and performance of the Tiverton Power facility, thereby enhancing electric grid reliability and reducing consumer costs;
- Reduce air pollutant emissions per unit of electricity produced;
- Have insignificant impacts on ambient air quality;
- Not require an increase in or significant change to the facility's footprint or boundaries.
- Not impact the local water supply infrastructure;
- Not have a wastewater discharge;
- Not increase employment or traffic;
- Not have a significant noise impact;
- Not impact wetlands or drainage at or near the site; and
- Not have any impact on the coastal environment.

For these reasons, Tiverton Power LLC believes that the proposed turbine upgrades do not constitute an "alteration" under R.I.G.L. § 42-98-4, and thus do not require a license from the EFSB. We respectfully request that the EFSB determine that no EFSB review or license is required. If you have any questions on this submittal, or require additional information, please do not hesitate to contact me.

Thank you for your attention to this matter.

Very truly yours,



Gerald J. Petros
Alexandra K. Callam

Enclosure

TABLE 1
TIVERTON POWER IMPACTS COMPARED TO NATIONAL AMBIENT AIR QUALITY STANDARDS

Proposed Turbine Upgrades
Tiverton Power LLC
Tiverton, Rhode Island

Pollutant	Averaging Time	Tiverton Maximum Modeled Impact ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Below NAAQS ?
NO_2	1-Hour	4.9	80	85	188	yes
	Annual	0.12	20	19.8	100	yes
CO	1-Hour	16	2,346	2,362	40,000	yes
	8-Hour	9	1,495	1,504	10,000	yes
SO_2	1-hour	2.5	123	126	196	yes
	Annual	0.1	6.3	6.3	80	yes
$PM_{2.5}$	24-Hour	1.6	21	22	35	yes
	Annual	0.1	8.8	8.9	12	yes
PM_{10}	24-Hour	1	31	32	150	yes

Notes:
1. Modeled CO impacts based on the receptor with highest, second high concentration that occurred within 5-year modeled years.
2. Modeled NO_2 1-hour impacts based on the receptor with the highest 5-year average of the 98th percentile 1-hour daily maximum concentrations.
3. Modeled SO_2 1-hour impacts based on the receptor with the highest 5-year average of the 99th percentile 1-hour daily maximum concentration.
4. Modeled $PM_{2.5}$ 24-hour impacts are based on the receptor with highest average of the maximum modeled 24-hour averages in the 5 modeled years.
5. Modeled 24-hour PM_{10} impacts are based on the receptor with the highest, sixth high 24-hour concentration over the 5 years modeled.
6. Modeled $PM_{2.5}$ annual impacts are based on the receptor with highest annual average impacts over the 5 modeled years.
7. Modeled annual SO_2 and NO_2 impacts are based on the highest annual impacts at any receptor.
8. Background concentrations provided by RIDEM.
9. Total concentration is the sum of the maximum modeled impact for all sources and the background concentration.

TABLE 2
TIVERTON POWER IMPACTS COMPARED TO ALLOWABLE INCREMENTS

Proposed Turbine Upgrades
Tiverton Power LLC
Tiverton, Rhode Island

Pollutant	Averaging Time	PSD Allowable Increment ($\mu g/m^3$)	Tiverton Power Maximum Increment Consumption ($\mu g/m^3$)	All Sources Maximum Increment Consumption ($\mu g/m^3$)	Increment within Allowable?
NO_2	Annual	25	0.12	0.12	Yes
SO_2	3-Hour	512	2.55	2.55	Yes
	24-Hour	91	1.06	1.06	Yes
	Annual	20	0.05	0.05	Yes
$PM_{2.5}$	24-Hour	9	1.59	1.59	Yes
	Annual	4	0.08	0.08	Yes
PM_{10}	24-Hour	30	1.59	1.59	Yes
	Annual	17	0.08	0.08	Yes

Notes:
1. The Tiverton facility consumes increment for NO_2, SO_2, $PM_{2.5}$, and PM_{10}.
2. Maximum increment consumption is the highest annual or highest, second high short-term concentration that occurred within the 5-year period modeled.

TABLE 3
TIVERTON POWER IMPACTS COMPARED TO REGULATION 22 ACCEPTABLE AMBIENT LEVELS FOR TOXIC AIR POLLUTANTS

Proposed Turbine Upgrades
Tiverton Power LLC
Tiverton, Rhode Island

Toxic Air Pollutant	Emission Factor (lb/MMBTU)	Maximum Emission Rate (lb/hr)	Max 1-hour impact ($\mu g/m^3$)	1-Hour AAL ($\mu g/m^3$)	Max 24-hour impact ($\mu g/m^3$)	24-Hour AAL ($\mu g/m^3$)	Max Annual Impact ($\mu g/m^3$)	Annual AAL ($\mu g/m^3$)	In compliance?	Max. Percent of AAL
Ammonia	0.0136	29.05	7.6186	1000	2.82	100	0.114	70	Yes	2.82%
1,3 Butadiene	4.30E-07	0.00092	0.0002	-	0.0001	-	0.0000036	0.03	Yes	0.01%
Acetaldehyde	4.00E-05	0.0852	0.0223	-	0.0083	-	0.00033	0.5	Yes	0.07%
Acrolein	6.40E-06	0.0136	0.0036	0.2	0.0013	-	0.000054	0.0200	Yes	1.79%
Benzene	1.20E-05	0.0256	0.0067	30	0.0025	20	0.00010	0.100	Yes	0.10%
Ethylbenzene	3.20E-05	0.0682	0.0179	40000	0.0066	10000	0.00027	-	Yes	0.0001%
Formaldehyde	7.10E-04	1.5123	0.3966	50	0.147	40	0.0059	0.080	Yes	7.43%
Naphthalene	1.30E-06	0.0028	0.0007	-	0.0003	3	0.000011	0.030	Yes	0.04%
PAH B(a)P Equiv.	2.55E-07	0.0047	0.0012	-	0.0005	-	0.000018	0.00009	Yes	20.46%
Propylene oxide	2.90E-05	0.00054	0.0001	3000	0.0001	-	0.000002	0.3	Yes	0.0007%
Sulfuric Acid	-	0.98	0.26	100	0.095	-	0.0038	1	Yes	0.38%
Toluene	1.30E-04	0.0618	0.0162	4000	0.0060	-	0.00024	300	Yes	0.0004%
Xylenes	6.40E-05	0.2769	0.0726	9000	0.0269	3000	0.00109	100	Yes	0.0011%

Notes:
1. Ambient impacts were based on the receptor with the highest concentration for each averaging period in any of the 5 years modeled.