

August 25, 2016

Via Federal Express/Electronic Mail

Todd Anthony Bianco, EFSB Coordinator
RI Energy Facilities Siting Board
89 Jefferson Blvd.
Warwick, RI 02888

Re: Invenergy Docket No. SB-2015-06

Dear Mr. Bianco:

On behalf of Invenergy Thermal Development LLC (“Invenergy”), enclosed please find an original and 10 copies of Invenergy’s Response to the Town of Burrillville’s 16th Set of Data Requests and accompanying exhibit.

Please let me know if you have any questions.

Very truly yours,



ALAN M. SHOER
ashoer@apslaw.com

Enclosures

cc: Service List

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
ENERGY FACILITY SITING BOARD

IN RE: INVENERGY THERMAL DEVELOPMENT LLC's
APPLICATION TO CONSTRUCTION THE
CLEAR RIVER ENERGY CENTER IN
BURRILLVILLE, RHODE ISLAND

DOCKET No. SB-2015-06

**INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO
THE TOWN OF BURRILLVILLE'S 16th SET OF DATA REQUESTS**

16-1 Please provide details of the potential exposure to natural gas shortages that may require the proposed plant to utilize its onsite water supply and potentially have to use back up methods, such as trucking water.

RESPONSE It is very difficult to quantify the potential exposure to natural gas shortages for Clear River Energy Center ("CREC"). Historical precedent for shortages have shown them to be infrequent and of short duration. If Invenergy Thermal Development LLC ("Invenergy") observes plants in the New England ("NE") area that have dual fuel capabilities of similar size to CREC, their average maximum consecutive hours that they ran on fuel oil in 2014 and 2015 was 72 hours and 68 hours respectively. There are however several reasons why Invenergy believes these numbers are higher than we would expect for CREC:

1) CREC is located directly on the Algonquin main line and closer to the natural gas supply source than the plants included in this historical analysis.

2) The information to assess whether a gas shortage has occurred is not readily available. As such, in this analysis it was assumed that the use of fuel oil coincided with a natural gas shortage event. In reality, fuel oil can be used for other reasons such as for maintenance or for a plant located on a lateral or at the end of a lateral if gas capacity was not available. Therefore, it is our expectation that the maximum consecutive hours based on natural gas shortages would be lower for CREC.

3) Pipeline infrastructure projects such as Atlantic Bridge and Spectra's AIM project will increase the availability of gas supply to NE gas power generators and reduce the severity of natural gas shortages.

Accordingly, Invenergy has designed our water systems to include an appropriate level of water storage capacity on site to allow for continued operation on fuel oil for these short duration natural gas shortages and do not anticipate a need for a backup water supply that would be trucked to the site.

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**INVENERGY THERMAL DEVELOPMENT LLC'S RESPONSES TO
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RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: August 25, 2016

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16-2 Please provide data showing what has actually happened with regard to natural gas shortages requiring power plants in the ISO-NE local zone to switch from natural gas to diesel fuel and provide details about each incident available within the last five years.

RESPONSE 16-2: As mentioned, it is very difficult to correlate historical fuel oil burn with natural gas shortages since this will be impacted by generators contracted capacity and where plants are located on the natural gas pipeline system.

One way to explore potential for dual fuel units to switch over to oil is to examine the data from ISO-NE who provided an analysis of historical events that would have been periods when supply shortages would have occurred and possibly triggered "Pay for Performance" penalties. The summary of this data is as follows:

There were 178 events in the 7 year, 4 month study period;

The average event was 29 minutes, the maximum event was 285 minutes;

The majority of events were less than one hour; and

There were only three events greater than two hours.

(www.iso-ne.com/static-assets/documents/markets/othrmkts_data/fcm/doc/opr_reserve_deficiency_info_hist_data_updated_5_21_2014.zip)

Note however, that the supply shortage in these instances were not necessarily due to gas supply shortages.

Based on our analysis, there were three recently observed natural gas shortages in the ISO-NE which resulted in dual fired plants using fuel oil:

- 1) The most severe example where natural gas supply was compromised was what is referred to as the polar vortex in

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Winter 2013/2014 where the area saw the coldest temperatures observed in two decades. In this instance, dual fuel fired plants of similar size ran for on average maximum 72 hours.

- 2) The second instance was also due to a cold front that happened in 2015. This resulted in plants of a similar size to CREC running on average a maximum of 68 consecutive hours on fuel oil.
- 3) This month, Algonquin had to curtail interruptible gas and reduce firm transport to 80% of contracts because of the Oxford Compressor outage. While detailed information is not yet available, it is expected that this could have caused some units to switch from gas to fuel oil.

Invenergy also examined data associated with when plants that have dual fuel capability have fired oil. Invenergy identified all ISO-NE plants with dual fuel capability ("DFC"), and there are 7,052 MW DFC units out of 17,184 MW NG units. Invenergy identified all instances in 2014 and 2015 where the dual fuel units were operated on fuel oil and the duration of the fuel oil run events were:

- On average, Units are running 16 hours.
- When outliers (>100 hr runs) are removed from the data set, the average drops to 8 hours.

More Information is included in **Exhibit 1**, which includes some graphics around where the dual fuel fired power plants are located in NE, their operating capacity, average consecutive hours run in 2015, maximum consecutive hours run in 2015 and the natural gas pipeline infrastructure.

Some key points on the data included:

- 1) The plants with high fuel oil usage (based on hours) generally are on or at the end of natural gas lines or laterals off of the main line.
- 2) DFC plants on the main line have relatively lower number of hours on fuel oil suggesting they are less likely to switch to oil in a gas shortage events based on their superior access to gas.

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- 3) The amount of DFC capable plants is only about 25% of the peak load.

In **Exhibit 1**, the maps shown of dual fuel units running on oil were built using the [Velocity Suite Online](#) application, created by ABB. Specifically, the ABB Database of Unit Generation & Emissions - Hourly (Standard), which provides unit-level hourly generation and emissions data for fossil-fuel generating units. The hourly data comes from the US EPA (CEMS reporting), the Nuclear Regulatory Commission, the Alberta Electric System Operator and the Ontario IESO.

The CEMS database can be accessed directly from this public website:
<https://ampd.epa.gov/ampd/>.

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16-3 Please explain how the potential exposure to natural gas shortages, as described above, would change if Invenergy opted to obtain fixed gas supply contracts for both of its turbines rather than for only one.

RESPONSE 16-3: Even with a firm supply, there could still be exposure to shortages if an event on the gas pipeline prevented delivery. Such an event occurred a few weeks ago where the Algonquin Pipeline had an outage and reduced flow on the system. On August 16, 2016, the pipeline restricted all nominations by shippers holding interruptible contracts and 18% of nominations by shippers holding firm contracts through the Oxford, CT compressor station. The pipeline also restricted out-of-path nominations, which shippers use to move gas through receipt and delivery points that are not part of their established contracts through the compressor station. It is not certain that this could have impacted CREC, but CREC would not be immune to such outages even with firm supply contracts. The expected frequency of such an event would be less with a full fixed gas supply contracts for both of its turbines rather than for only one; however, the cost for such a contract is most likely prohibitive.

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16-4 Please provide all information demonstrating whether there is a history or pattern of extended natural gas shortages for power plants in the ISO-NE local zone, how long those shortages typically last, the likelihood that fuel oil will be needed to run the plant, and how many instances where such shortage could last longer than 3.65 days.

RESPONSE 16-4: An analysis of all dual fuel units was done in the ISO-NE, and it was observed that in general gas shortages typically occurred during cold temperatures where residential and commercial heating demand peaked. In the last five years, only 2014 and 2015 saw impactful natural gas shortages where dual fuel units burned fuel oil. Based on 23 plants observed in this area:

- On average, the shortages typically lasted 0.71 days, with the largest consecutive outage lasting on average 2.03 days.
- The average plant saw 1 instance where a natural gas shortage lasted longer than 3.65 days. Sixteen plants never experienced a shortage that lasted longer than 3.65 days and seven plants observed a shortage that lasted longer than 3.65 days.
- The plants that saw these longer durations were not located on the main pipeline.

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16-5 Please identify in detail all water supplies for the proposed facility that you currently have under consideration and the development status of each one.

RESPONSE 16-5: Due to the confidential nature of the discussions we are involved with potential suppliers, we are not able to disclose the names of the counterparties. For each of the options we are examining, we are simultaneously performing the development work, permitting evaluation and engineering to determine viability. There are viable alternatives, and we anticipate making a selection in the very near term.

RESPONDENT: John Niland, Invenergy Thermal Development LLC

DATE: August 25, 2016

INVENERGY THERMAL DEVELOPMENT LLC
By its Attorneys,

/s/ Alan M. Shoer

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Dated: August 25, 2016

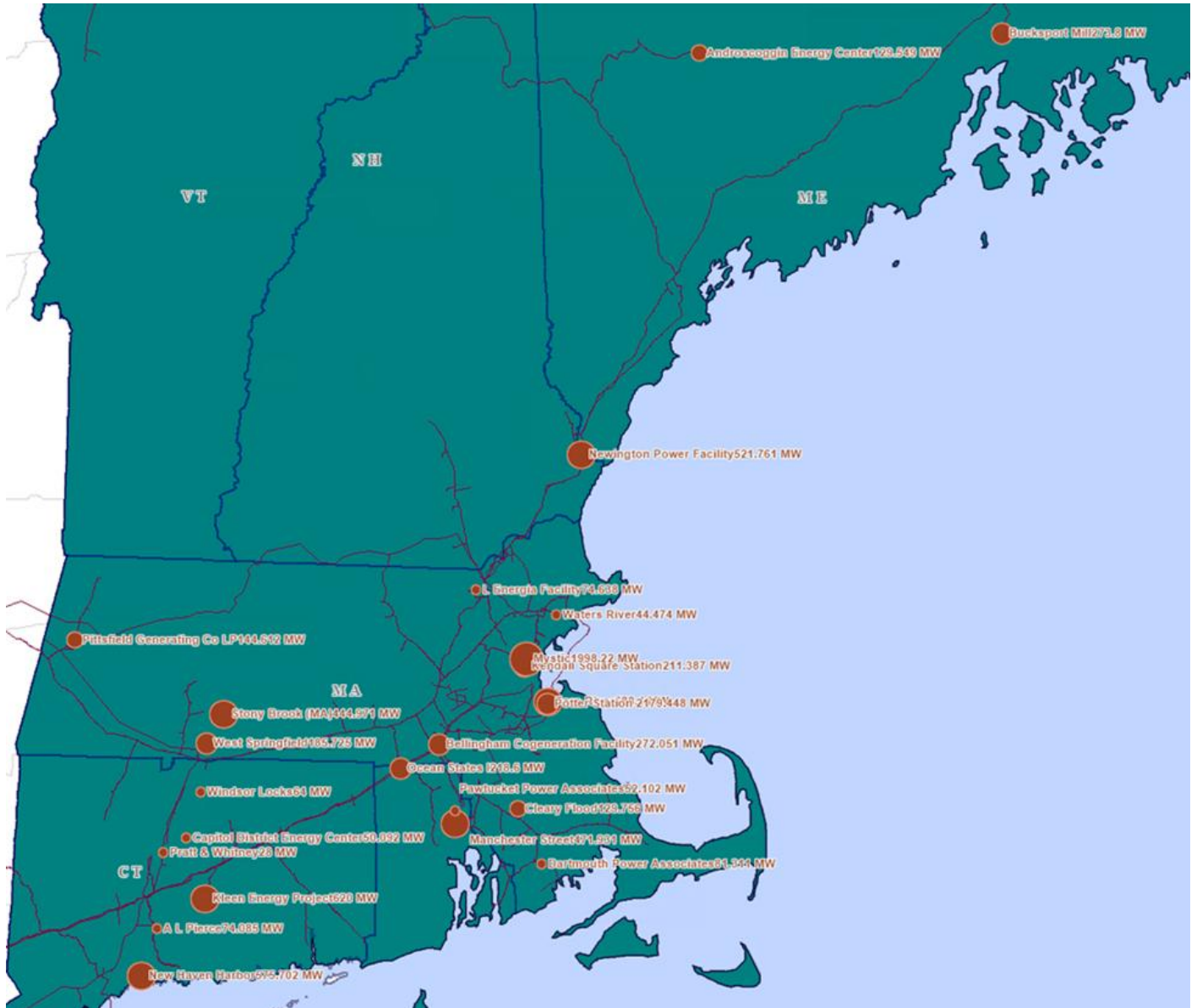
CERTIFICATE OF SERVICE

I hereby certify that on August 25, 2016, I delivered a true copy of the foregoing responses to the Town of Burrillville's 16th Set of Data Requests via electronic mail to the parties on the attached service list.

/s/ Alan M. Shoer

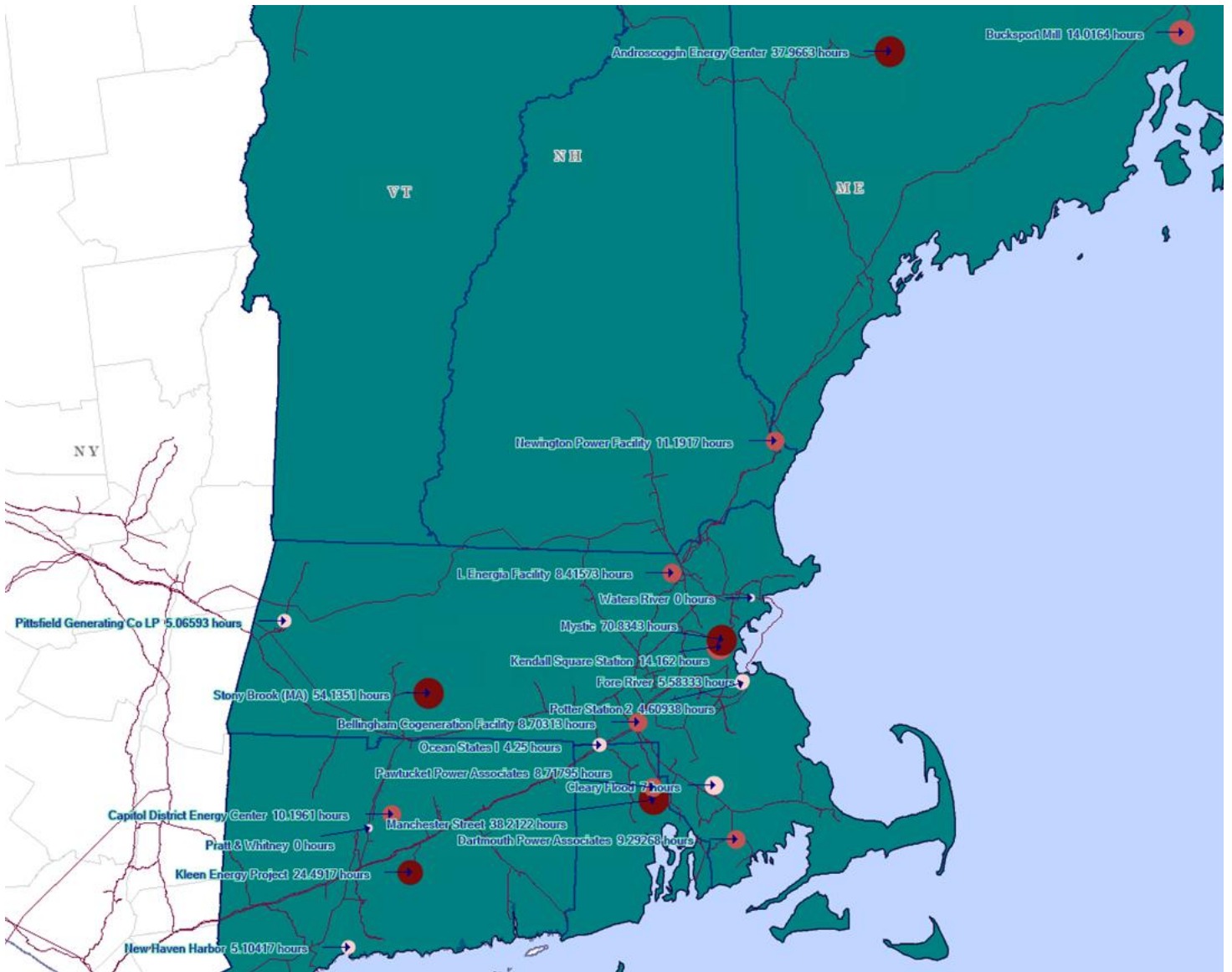
Invenergy's Response to the Town's Data Request – Set 16
Exhibit 1

Dual Fuel Plants Showing Operating Capacity



Invernergy's Response to the Town's Data Request – Set 16
Exhibit 1

Dual-Fuel Plants Showing Average Consecutive Hours Run in 2015



Invenergy's Response to the Town's Data Request – Set 16
Exhibit 1

Dual Fuel Plants Showing Maximum Consecutive Hours Run in 2015

