UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF AIR AND RADIATION

April 15, 2021

Mr. Timothy Leary
Designated Representative
Footprint Power Salem Harbor Development L.P.
24 Fort Ave.
Salem, Massachusetts 01970

Re: Petition to use hourly gross calorific value analysis in calculation of hourly heat input for units 1 and 2 at the Salem Harbor Station NGCC (Facility ID (ORISPL) 60903)

Dear Mr. Leary:

The United States Environmental Protection Agency (EPA) has reviewed the November 15, 2019 petition submitted by Footprint Power Salem Harbor Development L.P. (Footprint Power) under 40 CFR 75.66 requesting permission to use hourly average measurements, rather than monthly averages, of the gross calorific value (GCV) of pipeline natural gas to perform emissions calculations for units 1 and 2 at the Salem Harbor Station NGCC (Salem Harbor). EPA approves the petition, with conditions, as discussed below.

Background

Footprint Power owns and operates Salem Harbor, which is located in Salem, Massachusetts. Salem Harbor units 1 and 2 are combined cycle combustion turbines, each of which serves an electricity generator with a nominal design rating of 240.7 MW a as well as a heat recovery steam generator, a steam turbine, and a second electricity generator with a nominal design rating of 158.4 MW. These units combust pipeline natural gas.

According to Footprint Power, Salem Harbor units 1 and 2 are subject to the Acid Rain Program. Therefore, Salem Harbor is required to continuously monitor and report sulfur dioxide (SO_2) and carbon dioxide (CO_2) mass emissions, nitrogen oxides (NO_X) emission rate, and heat input for these units in accordance with 40 CFR part 75.

Acid Rain Program-affected units that meet the definition of "gas-fired" or "oil-fired" in 40 CFR 72.2 may use the excepted methodology in appendix D to part 75 to determine SO_2 mass emissions and unit heat input instead of installing continuous emission monitoring systems (CEMS). Footprint Power has elected to use the appendix D methodology for units 1 and 2.

The appendix D methodology requires continuous monitoring of the fuel flow rate and periodic sampling of the fuel characteristics, including sulfur content, GCV, and density (if needed). As per section 2.3.4.1 of appendix D, the GCV of pipeline natural gas must be determined at least once in every month in which the fuel is combusted for 48 hours or more (and at least once in each calendar quarter in which the unit operates). If multiple GCV samples are taken and analyzed in a particular month, section 2.3.4.1 provides that, "the GCV values from all samples shall be averaged arithmetically to obtain the monthly GCV." Furthermore, section 2.3.7(c)(1) of appendix D states that, "[i]f multiple samples are taken and averaged, apply the monthly average GCV to the entire month."

Thus, for units such as Salem Harbor units 1 and 2 that combust pipeline natural gas, for each hour of unit operation in a given month, the measured hourly fuel flow rate and the average monthly GCV value are used to calculate the hourly unit heat input. The hourly heat input rate is then multiplied by a default SO_2 emission rate to calculate the hourly SO_2 mass emissions.

Salem Harbor's fuel supplier, Spectra Energy, owns, operates, and maintains continuous gas chromatographs which provide hour-by-hour measurements of the GCV of the fuel burned at the facility. Footprint Power believes the most accurate hourly heat input rates are obtained when hourly GCV values are coupled with hourly measurements of fuel flow rate. In view of this, Footprint Power submitted a petition to EPA requesting permission to use hourly GCV values, rather than monthly averages, in the emission calculations for units 1 and 2.

EPA's Determination

EPA approves Footprint Power's petition to use hourly measurements of the gross calorific value of pipeline natural gas, as an option in lieu of monthly arithmetic average GCV values, in the emissions calculations. The Agency concurs that using hourly, rather than monthly, GCV values together with hourly fuel flow rates is likely to provide more accurate hourly heat input rate data. Furthermore, hour-by-hour measurement of the GCV far exceeds the minimum sampling frequency for pipeline natural gas (i.e., once per month) specified in section 2.3.4.1 of appendix D. EPA notes that approval of the requested authorization to use hourly GCV measurements does not preclude Footprint Power from alternatively continuing to use monthly average GCV values in accordance with the regulations.

Conditions of Approval

As a condition of this approval, for periods of missing GCV data, Footprint Power shall use substitute data values in the calculations, as follows:

1. Provided that at least one valid GCV measurement is obtained in a given month, substitute, for each hour of the missing data period, the arithmetic average of the GCV values from the hour before and the hour after the missing data incident; or

2. In accordance with section 2.4.1 of appendix D to part 75, if no valid GCV values are obtained in a given month, substitute, for each hour of the missing data period, the maximum potential GCV value of 110,000 Btu per 100 standard cubic foot (scf) from table D-6 in appendix D.

Because Salem Harbor's fuel supplier operates the gas chromatographs and has an economic incentive to ensure that the GCV measurements produced by the chromatographs are not biased low (while Salem Harbor has an analogous economic incentive to ensure that the GCV measurements are not biased high), EPA considers it reasonable to treat the gas chromatographs for purposes of this petition in the same manner as gas billing meters are treated under the part 75 regulations. Accordingly, in these circumstances EPA believes it is reasonable to approve Footprint Power's petition without establishing conditions regarding the operation and maintenance of the chromatographs or related quality assurance/quality control procedures.

EPA's determination relies on the accuracy and completeness of the information provided by Footprint Power in the November 15, 2019 petition and subsequent e-mail communications (March 16, 2020; July 21, 2020; September 24, 2020; October 7 and 8, 2020) and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Jenny Jachim at jachim.jenny@epa.gov or (202) 343-9590.

Sincerely,

REID HARVEY Digitally signed by REID HARVEY Date: 2021.04.15 16:52:32 -04'00'

Reid Harvey, Director
Clean Air Markets Division

cc: Richard Conway, Salem Harbor Station
Susan Lancey, EPA Region 1
Todd H. Wheeler, Massachusetts DEP