September 8, 2014

Mr. Leonard J. Fagan
Designated Representative
Gainesville Renewable Energy Center
11201 NW 13th Street
Gainesville, FL 32653

Re: Petition Request for a Site-Specific Default Moisture Value for Unit BFB1 at the Gainesville Renewable Energy Center (Facility ID (ORISPL) 57241).

Dear Mr. Fagan:

The United States Environmental Protection Agency (EPA) has reviewed the January 15, 2014 petition submitted under 40 CFR 75.66 by Gainesville Renewable Energy Center, LLC (GREC), requesting approval of a site-specific default moisture value for Unit BFB1 at its Gainesville facility.[1] EPA approves the petition in part, with conditions, as discussed below.

Background

GREC owns and operates the Gainesville facility, which is located in Alachua County, Florida. Gainesville Unit BFB1 is a bubbling fluidized bed boiler that serves a 100-MW generator and combusts primarily wood fuel, as well as pipeline natural gas during unit startup. According to GREC, Unit BFB1 is subject to the Acid Rain Program and the Clean Air Interstate Rule trading programs for sulfur dioxide ($SO_2$) and annual and ozone-season nitrogen oxides ($NO_X$). GREC is therefore required to continuously monitor and report the unit's $SO_2$, $NO_X$, and carbon dioxide ($CO_2$) mass emissions, $NO_X$ emission rate, and heat input rate in accordance with 40 CFR Part 75.

To meet the Part 75 monitoring requirements, GREC has installed and certified continuous emission monitoring systems (CEMS) for $SO_2$, $NO_X$, and $CO_2$ as well as a continuous stack gas flow monitoring system. The Unit BFB1 CEMS include gas analyzers that measure $SO_2$, $NO_X$, and oxygen ($O_2$) concentrations on a dry basis (i.e., exclusive of stack moisture), while stack gas flow rate is always measured on a wet basis (i.e., inclusive of stack moisture). Because dry-basis and wet-basis measurements are being combined, each of the equations from Appendix F of Part 75 that GREC uses to compute mass emissions and heat input rate requires the use of a moisture correction factor.[2]

[1] The petition requests retroactive approval to November 18, 2013, the date of provisional certification of Unit BHB1's monitoring systems.

[2] According to Unit BFB1's monitoring plan, GREC uses Equation F-2 to compute $SO_2$ and $CO_2$ mass emissions (with the adjustments indicated in section 4.2 of Appendix F in the case of $CO_2$), Equation F-26b to compute $NO_X$ mass emissions, and Equation F-18 to compute heat input rate. Each of these equations combines dry-basis and wet-basis measurements and includes a moisture correction factor computed as [(100 – percent $H_2O$) / 100].

When moisture corrections are needed, under Part 75 a source generally can use either monitored moisture data from a continuous moisture monitoring system or, in certain situations, a conservative fuel-specific default moisture value.[3] In each of the Appendix F equations used by GREC to compute mass emissions and heat input, as the moisture percentage decreases, the reported mass emissions or heat input rate will increase. Therefore, for Unit BFB1, a "conservative" default moisture value would be a value that is conservatively low relative to the average actual stack moisture content at the unit and that therefore prevents under-reporting of mass emissions and heat input rate. For wood fuel, §75.11(b) generally authorizes the use of a fuel-specific default moisture value of 13.0% $H_2O$ without the need for specific EPA approval.[4] Use of a site-specific default value different from 13.0% $H_2O$ requires EPA approval.

In addition to the other continuous monitoring systems listed above, GREC has installed and certified a continuous moisture monitoring system at Unit BFB1 that computes stack moisture content from simultaneous wet-basis and dry-basis $O_2$ measurements, but GREC is dissatisfied with the system's performance. According to GREC, there are maintenance and accuracy concerns associated with the wet/dry $O_2$ moisture measurement methodology,[5] and GREC has therefore decided to discontinue use of the continuous moisture monitoring system and to use a default moisture value instead. However, according to GREC, the 13.0% $H_2O$ default moisture value provided in §75.11(b) for wood fuel is much lower than the actual moisture content of Unit BFB1's stack gas and is not appropriate.[6] For this reason, GREC submitted the January 15, 2014 petition seeking approval to use a higher, but still conservative, site-specific default moisture value to compute the unit's mass emissions and heat input rate.

Specifically, GREC seeks approval to use a site-specific default moisture value of 21.4% $H_2O$. According to the petition, this value represents the tenth percentile value of data collected using EPA Method 4 during the initial relative accuracy test audit (RATA) of the wet/dry $O_2$ moisture monitoring system at Unit BFB1. GREC further proposes to re-evaluate the appropriateness of the default moisture value each year during the unit's annual quality assurance RATAs. The approved default value prior to the annual RATA would continue to be used unless the average moisture percentage measured during the RATA is less than the approved default moisture value by a difference of more than 1.0% $H_2O$ (e.g., if the approved default value moisture prior to the RATA were 21.4% but the average moisture percentage measured during the RATA were less than 20.4%). If this should occur, the average moisture percentage from the annual RATA would become the new approved default moisture value. According to the petition, this proposed approach – i.e., determining a site-specific default moisture value based on the tenth percentile value of site-specific stack moisture content data, and then adjusting the approved default value if a subsequent RATA shows that the previously approved default value is

[3] See §75.11(b); see also 64 FR 28564, 28568 (May 26, 1999).

[4] Although by its terms §75.11(b) applies to only $SO_2$ monitoring, in the circumstances here §§75.71(b)(2) and 75.13(c), respectively, extend its application to $NO_X$ mass and $CO_2$ monitoring.

[5] See the March 17, 2014 e-mail from Ali Leaphart of GREC to Carlos Martinez of EPA.

[6] GREC also notes that the engineered design range of stack moisture for optimum performance of the unit is 22% to 27% $H_2O$.

insufficiently conservative – is consistent with approaches for determination of site-specific default moisture values approved by EPA at other units.

EPA's Determination

EPA agrees that, based on measurements taken at Unit BFB1, a default moisture value of 13.0% $H_2O$ is likely lower than the average actual moisture value for the unit, with the consequence that use of a 13.0% $H_2O$ value in mass emission computations would result in reported mass emissions higher than the unit's actual mass emissions. Further, GREC is correct that the approach of setting a site-specific default moisture value based on the tenth percentile value of site-specific measurements, and updating the site-specific default value if lower moisture values are measured in subsequent RATAs, has been approved by EPA for other units.[7] However, EPA has not previously approved site-specific default moisture values based solely on results from a single RATA when additional relevant site-specific data were available. Notably, when data from continuous moisture monitoring systems have been available, EPA has considered those data as well.[8]

In the case of Unit BFB1, quality-assured data from the unit's continuous moisture monitoring system are available for the period from November 18, 2013 (when the units' monitoring systems were provisionally certified) through December 31, 2013 (after which GREC elected to begin using a default moisture value instead of monitored moisture data from the continuous moisture monitoring system). Excluding data reported for hours when substitute data were reported or when the unit was starting up or shutting down, EPA determined that the remaining monitored moisture data ranged from 15.0% to 30.0% $H_2O$, with a median value of 18.8% $H_2O$ and a tenth percentile value of 16.3% $H_2O$. The 21.4% $H_2O$ value requested by GREC is higher than the ninetieth percentile value of the screened monitored data. Based on this analysis, EPA concludes that the 21.4% $H_2O$ value requested by GREC is not sufficiently conservative, but that the tenth percentile value of 16.3% $H_2O$ is a sufficiently conservative site-specific default moisture value for use at Unit BFB1 based on currently available data.

For the reasons discussed above, EPA conditionally approves GREC's petition to use a site-specific default moisture value for Unit BFB1 at its Gainesville facility, subject to adjustment if necessary based on the results of annual RATAs. EPA approves use of the site-specific default moisture value retroactively to either November 18, 2013 or January 1, 2014 (the date as of which GREC began using a default moisture value instead of monitored moisture data) at GREC's election. However, EPA does not approve the site-specific default moisture value of 21.4% $H_2O$ requested by GREC in the January 15, 2014 petition, but instead approves a site-specific default moisture value of 16.3% $H_2O$. The terms and conditions of this approval are as follows:

[7] See, e.g., EPA response to petition to use site-specific default moisture value at Taconite Harbor power plant (May 20, 2004), available at http://www.epa.gov/airmarkets/emissions/petitions.html.

[8] See, e.g., EPA responses to petition to use default moisture value at Glens Falls cement kiln (June 24, 2004) and petition to use site-specific default moisture values at Elizabethtown and Lumberton power plants (Mar. 15, 2004), available at http://www.epa.gov/airmarkets/emissions/petitions.html.

(1) If GREC chooses to use the approved site-specific default moisture value starting with data reported for January 1, 2014, then GREC must modify Unit BFB1's electronic monitoring plan as follows, and must resubmit any previously submitted quarterly emission reports whose reported data are inconsistent with these changes:

i. The moisture monitoring system (ID # 105) and formula F-31 must be deactivated, each with a closeout date of December 31, 2013.

ii. The Monitoring Method Data record with code "MWD" for parameter "H2O" must be deactivated as of December 31, 2013. A new record, with code "MDF", must be activated as of January 1, 2014. In the new record, the Substitute Data Code should be left blank.

iii. The approved default moisture value of 16.3% $H_2O$ must be added to the monitoring plan, using a Monitoring Default Data record with an activation date of January 1, 2014.

iv. The Monitoring Default Data record for the minimum potential moisture value (code "H2ON") must be closed out as of December 31, 2013.

(2) If GREC elects November 18, 2013 as the start date for use of the approved site-specific default moisture value, then GREC must meet the conditions stated under (1) above except that November 18, 2013 should be substituted for January 1, 2014 and November 17, 2013 should be substituted for December 31, 2013.

(3) GREC must modify the programming of the data acquisition and handling system (DAHS) to ensure that the approved default moisture value is being correctly applied to the emissions and heat input rate calculations.

(4) GREC must re-evaluate the appropriateness of the default moisture value each year during the annual RATA testing. GREC must continue to use the approved default moisture value prior to each annual RATA (e.g., initially 16.3% $H_2O$) unless the average moisture value measured during that RATA is less than the default moisture value in use prior to that RATA by a difference of more than 1.0% $H_2O$. If this should occur, GREC must use the average moisture percentage from that RATA as the new default moisture value.

(5) If and when a new default moisture value is determined, GREC must modify its electronic monitoring plan to reflect the change, and must ensure that the new moisture default value is applied to the emissions and heat input rate calculations, starting with the first unit operating hour after completion of the RATA testing.

Finally, EPA notes that the following additional corrections to the electronic monitoring plan for Unit BFB1 are necessary. First, the $O_2$ monitoring system (ID # 103) is not required by

Part 75 and should be deactivated.[9] Second, the Analyzer Range Data for the wet-basis $O_2$ component should be closed out because this component has been used only in the moisture monitoring system that is being deactivated.

EPA's determination relies on the accuracy and completeness of the January 15, 2014 petition, and is appealable under 40 CFR Part 78. If you have any questions regarding this determination, please contact Carlos R. Martinez at (202) 343-9747 or by e-mail at martinez.carlos@epa.gov. Thank you for your continued cooperation.

Sincerely,

/s/
Reid P. Harvey, Director
Clean Air Markets Division

cc: David McNeal, EPA Region IV
Jim Pennington, Florida DEP
Carlos R. Martínez, CAMD

[9] Under §75.20(c)(3), for a diluent gas monitor that is used both as a $CO_2$ monitoring system and to determine heat input rate (which is the case for Unit BFB1's dry-basis $O_2$ monitor), only one set of certification test data is required, i.e., under the $CO_2$ system ID. Therefore, it is unnecessary to create and certify a separate $O_2$ monitoring system. If the $O_2$ monitor were used only to determine heat input rate, then a separate $O_2$ monitoring system would be required.