

June 1, 2009

Mr. Timothy R. Schimke  
Plant Manager  
Cadillac Renewable Energy  
1525 Frank Miltner Street  
Cadillac, Michigan 49601

Re: Petition to Use a Default SO<sub>2</sub> Emission Rate for Unit EUBLR at the Cadillac Renewable Energy Power Station (Facility ID (ORISPL) 54415)

Dear Mr. Schimke:

The United States Environmental Protection Agency (EPA) has reviewed the June 9, 2008 petition submitted under §75.66 by Cadillac Renewable Energy (Cadillac), in which Cadillac requested to use a default emission rate to report hourly sulfur dioxide (SO<sub>2</sub>) mass emissions for Unit EUBLR at the Cadillac Renewable Energy power plant. Specifically, Cadillac requested to use a default SO<sub>2</sub> emission rate of 0.00024 lb/mmBtu to report hourly SO<sub>2</sub> mass emissions. EPA approves the petition in part, with conditions, as discussed below.

#### Background

Unit EUBLR at Cadillac's Wexford County, Michigan facility is a 39.6 MW wood-fired boiler at an independent power plant. The unit burns primarily waste wood and uses natural gas for start-ups only. According to Cadillac, Unit EUBLR is subject to the Clean Air Interstate Rule (CAIR) annual and ozone season programs. Therefore, for this unit, Cadillac is required to continuously monitor and report nitrogen oxides (NO<sub>x</sub>) mass emissions and heat input by January 1, 2008 and to monitor and report SO<sub>2</sub> mass emissions by January 1, 2009, in accordance with 40 CFR Part 75.

The June 9, 2008 petition states that SO<sub>2</sub> emissions from Unit EUBLR are about one ton annually and that the wood fired in Unit EUBLR has a sulfur content of 0.02% by weight, based on a fuel analysis submitted with the petition. The petition further states that the natural gas combusted in the unit has a sulfur content of 0.1%, based on vendor information. According to Cadillac, both of these fuels meet the definition of "very low sulfur fuel" in 40 CFR 72.2.

Under §75.11(f), the owner or operator of a unit that combusts wood, refuse, or other material in addition to oil or gas may submit a petition to the Administrator requesting to use the provisions in §75.11(e)(1). Section 75.11(e)(1) allows the owner or operator to report SO<sub>2</sub> mass emissions using Equation F-23 in section 7 of Appendix F to Part 75, and a default SO<sub>2</sub> emission rate approved by petition. In the June 9, 2008 petition, Cadillac requested to use a site-specific

default SO<sub>2</sub> emission rate of 0.00024 lb/mmBtu with Equation F-23 to determine SO<sub>2</sub> emissions for all hours of operation of Unit EUBLR.

### EPA's Determination

EPA approves Cadillac's petition to use a default SO<sub>2</sub> emission rate and Equation F-23 to quantify SO<sub>2</sub> mass emissions from Unit EUBLR. However, the Agency disapproves the 0.00024 lb/mmBtu SO<sub>2</sub> emission rate requested by Cadillac. The approved default SO<sub>2</sub> emission rate is, instead, 0.046 lb/mmBtu, for all hours in which Unit EUBLR combusts wood, natural gas, or a mixture of the two fuels. Alternatively, Cadillac may use the fuel sampling procedures in Appendix D to Part 75 to determine a fuel-specific default SO<sub>2</sub> emission rate for natural gas and may use that emission rate when only natural gas is combusted in the unit.

Cadillac used the results of an emission test from 1998 in conjunction with Equation F-23 to calculate the proposed SO<sub>2</sub> emission rate of 0.00024 lb/mmBtu. However, the concentration of 0.12 ppm of SO<sub>2</sub> measured during the stack test was less than the minimum detectable limit of 3.4 mg SO<sub>2</sub>/m<sup>3</sup> (1.3 ppm) specified in EPA Method 6<sup>1</sup>, which was the SO<sub>2</sub> reference method used for the testing. Therefore, EPA has determined that it would be more appropriate to use a mass balance approach to calculate the default SO<sub>2</sub> emission rate. Cadillac provided the results of a 2006 analysis of the wood combusted by Unit EUBLR, as an enclosure with the June 9, 2008 petition. EPA calculated the approved default SO<sub>2</sub> emission rate of 0.0464 lb/mmBtu, by substituting the results of this analysis (i.e., 0.02% sulfur and a gross calorific value (GCV) of 4312 Btu/lb) into the following equation<sup>2</sup>:

$$ER = 2.0 \times 10^4 \left( \frac{\%S}{GCV} \right) \quad (\text{Equation 1})$$

Where:

- ER = Default SO<sub>2</sub> emission rate for wood combustion (lb/mmBtu).
- %S = Total sulfur content of the wood (percent)
- GCV = Gross calorific value of the wood (Btu/lb)
- 2.0 x 10<sup>4</sup> = Conversion factor (lb SO<sub>2</sub>-Btu / %S-mmBtu-lb wood)

### Conditions of Approval

The conditions of this approval are as follows:

1. Cadillac shall use Equation F-23 in section 7 of Appendix F to Part 75 to calculate all hourly SO<sub>2</sub> mass emission rates for Unit EUBLR. Cadillac shall make

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<sup>1</sup> Method 6 is found in Appendix A-4 to 40 CFR Part 60.

<sup>2</sup> Equation 1 is derived from a mass balance, assuming that all of the sulfur in the fuel is oxidized to SO<sub>2</sub>, as follows: S + O<sub>2</sub> → SO<sub>2</sub>. The equation is a variant of Equation 19-25 in EPA Method 19, in Appendix A-7 to 40 CFR Part 60, and has been adapted for wood sampling in lieu of coal.

appropriate modifications to the electronic monitoring plan for Unit EUBLR, to represent this SO<sub>2</sub> monitoring methodology.

2. The approved default SO<sub>2</sub> emission rate of 0.046 lb/mmBtu shall be used whenever any amount of wood is combusted in the unit. For those hours in which the unit combusts only natural gas, Cadillac may, alternatively, use a fuel-specific default SO<sub>2</sub> emission rate determined in accordance with Appendix D to Part 75.
3. At least once a year, Cadillac shall sample the wood combusted in Unit EUBLR and shall analyze it for total sulfur and GCV. Based on the results of the analysis, Equation 1, above, shall be used to calculate an SO<sub>2</sub> emission factor. If multiple analyses are performed during the year, the highest sulfur and lowest GCV value from the analyses shall be used in the calculation. If, for a particular year, the SO<sub>2</sub> emission rate calculated in this manner is higher than the default rate currently in use, Cadillac shall report the new value in the quarterly electronic data report and shall apply the new value, starting on January 1 of the next year.
4. Cadillac shall continue to monitor and report NO<sub>x</sub> mass emissions and heat input for Unit 01, in accordance with Part 75.

EPA's determination relies on the accuracy and completeness of the information provided by Cadillac in the June 9, 2008 petition and is appealable under Part 78. If you have any questions about this determination, please contact Louis Nichols, at (202) 343-9008. Thank you for your continued cooperation.

Sincerely,

/s/

Sam Napolitano, Director  
Clean Air Markets Division

cc: Constantine Blathras, EPA Region V  
Tom Gasloli, Michigan DEQ  
Louis Nichols, EPA CAMD