



September 9, 2009

Via Electronic Mail and U.S. Mail

Florida Department of Environmental Protection
Bureau of Air Regulation, Division of Air Resource Management
2600 Blair Stone Road, M.S. 5500
Tallahassee, FL 32399-2400

Attention: Mr. Alvaro Linero, Director of Special Projects
(alvaro.linero@dep.state.fl.us)

**RE: Air Construction Permit No. 0470016-001-AC
Supplement Request No. 03 – 090809 – Submission of Additional
Information Including Updated Carbon Monoxide (CO) Emission Rate Data
Application for ADAGE Hamilton LLC - Air Construction Permit
Proposed Nominal Net 53 MW Woody Biomass Electric Power Plant
Hamilton County, Florida**

Dear Mr. Linero:

ADAGE Hamilton LLC (ADAGE) submitted an application for an air construction permit to the Florida Department of Environmental Protection, Bureau of Air Regulation, Division of Air Resource Management (Bureau) on May 20, 2009 for the construction of a proposed nominal 50 MW Woody Biomass Electric Power Plant to be located in Hamilton County, Florida. Supplemental information was also provided to the Bureau on June 19, 2009 (referred to as Supplement #01-061809) and on July 17, 2009 (Supplement #02-071009).

ADAGE, the applicant, hereby submits additional information (referred to as Supplement #03-090809) to support the information provided in the initial air construction permit application dated May 20, 2009 and supplements dated June 19, 2009 and July 17, 2009. The information provided specifically pertains to updated technical information, as well as emissions data.

225 Wilmington West Chester Pike Suite 302
Chadds Ford, PA 19317

To clarify prior information submitted to the Bureau, the gross electrical output of the power plant will be approximately 62 megawatts (MWs) and the nominal net electrical output of the power plant is now estimated to be 53 MWs. The net MW output takes into account electrical demands required by plant operations and can vary depending on the operational phases of the plant and climatic conditions. The initial information provided by ADAGE referred to a nominal net rating of 50 MWs.

ADAGE has selected the vendor who will be supplying the bubbling fluidized bed (BFB) boiler for the Hamilton County woody biomass power plant. The selected vendor indicates that the CO emission rate is estimated to be 0.08 lbs/MMBtu which is slightly higher than the original engineering estimate of 0.07 lbs/MMBtu due to fuel variability. This emission rate pertains to operation of the BFB boiler during the combustion of clean woody biomass (i.e., normal operating load) and excludes start-up, shutdown or malfunction conditions.

Despite this slight change in emission rate, ADAGE is not requesting a change to the maximum annual allowable CO emissions (i.e., tons/year) from the proposed BFB boiler. ADAGE is requesting a synthetic limit of 232.4 tons per year from the BFB boiler

A revised version of Table 2-2, reflecting this change, is attached to this submittal. Also attached is the updated application form page 14 of the emission unit information form for the proposed BFB Boiler. The form has been modified to indicate a synthetic limit is being proposed for CO emissions from the proposed BFB boiler.

During preparation of the revised form to reflect the request for a synthetic minor limit for CO, ADAGE reviewed the initial application's emissions data and concluded that for emission of oxides of nitrogen (NO_x) and sulfur dioxide (SO₂), the synthetically limited box (i.e., box 4) on the emission unit information form should also be checked "yes" for these two air pollutants. In addition, pages 12 and 13 of the emission unit information form for the BFB boiler have also been updated to include the synthetically limited request.

ADAGE is committed to supporting the Bureau with their permitting effort and will be available to answer any additional questions that may arise as a result of the information provided in this supplement.

Included with this submittal is the following information:

- Attachment A – Revised Table 2-2, and Pages 12, 13 and 14 of the Emission Unit Information application form for the BFB boiler; and
- Completed DEP Form No. 62-210.900 (1) – Professional Engineer Certification.

Should you have any questions, please do not hesitate to contact Ms. Vanessa Goff of ADAGE at (585) 749-7302. We look forward to continuing working with the Bureau on issuance of a construction permit for the proposed plant.

Very truly yours,
ADAGE Hamilton LLC

A handwritten signature in black ink, appearing to read 'F. Reed Wills', written in a cursive style.

F. Reed Wills
President

BEST AVAILABLE COPY

**Table 2-2
Estimated Potential to Emit Regulated NSR Air Pollutants from the Proposed Woody Biomass Fluidized Bed Boiler
ADAGE Hamilton LLC Hamilton County, Florida
Proposed Nominal 50-MW Woody Biomass Power Plant**

| Operating Scenario | | Startup, Shutdown, and Bed Stabilization | | Normal | | Maximum Hourly (lb/hr) | Maximum Annual (tons/year) |
|-------------------------------------------------------|-----------------------------------------------|------------------------------------------|----------------|----------------|----------------|------------------------|----------------------------|
| | | Maximum Hourly | Maximum Annual | Maximum Hourly | Maximum Annual | | |
| Applicable Time Period | | Maximum Hourly | Maximum Annual | Maximum Hourly | Maximum Annual | (lb/hr) | (tons/year) |
| Heat Input, H (mmBtu/hr) | | 240 | 240 | 758 | 758 | -- | -- |
| Annual Operating Hours, T (hours/year) | | -- | 8760 | -- | 8760 | -- | -- |
| PM ₁ (Filterable) | Emission Factor (lb/mmBtu) | 0.0056 | 0.0056 | 0.01 | 0.01 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 1.34 | 5.87 | 8 | 33 | 8 | 33 |
| PM _{2.5} (Condensable) | Emission Factor (lb/mmBtu) | 0.0019 | 0.0019 | 0.019 | 0.019 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 0.45 | 1.98 | 14 | 63 | 14 | 63 |
| PM (Total) | Emission Factor (lb/mmBtu) | 0.0075 | 0.0075 | 0.029 | 0.029 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 1.79 | 7.83 | 22 | 96.3 | 22 | 96.3 |
| PM ₁₀ | Emission Factor (lb/mmBtu) | 0.0075 | 0.0075 | 0.029 | 0.029 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 1.79 | 7.83 | 22 | 96.3 | 22 | 96.3 |
| PM _{2.5} | Emission Factor (lb/mmBtu) | 0.0075 | 0.0075 | 0.029 | 0.029 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 1.8 | 7.8 | 22 | 96.3 | 22 | 96.3 |
| NO _x ^(a) | Emission Factor (lb/mmBtu) | 0.3 | 0.2 | 0.3 | 0.07 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 72 | 210 | 227 | 232 | 227 | 232.4 |
| SO ₂ ^(a,d) | Emission Factor (lb/mmBtu) | 0.0006 | 0.0006 | 0.180 | 0.045 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 0.1 | 0.6 | 136 | 149.4 | 136 | 149.4 |
| H ₂ SO ₄ (Aerosols and Mist) | Emission Factor (lb/mmBtu) | 0.00004 | 0.00004 | 0.012 | 0.0077 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 0.009 | 0.040 | 9 | 25.6 | 9 | 25.6 |
| CO ^(a) | Emission Factor (lb/mmBtu) | 0.082 | 0.082 | 0.6 | 0.08 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 20 | 87 | 455 | 232 | 455 | 232.4 |
| VOC | Emission Factor (lb/mmBtu) | 0.0054 | 0.0054 | 0.017 | 0.017 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 1.3 | 5.7 | 13 | 56.4 | 13 | 56.4 |
| Fluorides ^(a) | Emission Factor (lb/mmBtu) | 0.0000 | 0.0000 | 0.008 | 0.008 | -- | -- |
| | Emission Rate (lb/hr "hourly" & tpy "annual") | 0.0 | 0.0 | 6 | 27 | 6 | 27.1 |

Calculation Method:

Maximum Hourly Emission Rate (lb/hr) = Maximum Hourly Heat Input (mmBtu/hr) x Maximum Hourly Emission Factor (lb/mmBtu)

Annual Emission Rate (tons/year) = Average Heat Input (mmBtu/hr) x Average Annual Emission Factor (lb/mmBtu) x Annual Operating Hours (hr/year) / (2000 lb/ton)

Sample Calculations:

Maximum Hourly PM Emission Rate for Normal Operating Scenario,

$$8 \text{ lb/hr} = 758 \text{ mmBtu/hr} \times 0.01 \text{ lb/mmBtu}$$

Annual PM Emission Rate for Normal Operating Scenario,

$$33 \text{ tons/year} = 758 \text{ mmBtu/hr} \times 0.01 \text{ lb/mmBtu} \times 8760 \text{ hours/year} / (2000 \text{ lb/ton})$$

Notes:

(a) Startup fuel is natural gas. Emission Factors based on AP-42 or NSPS (refer to Table 2-3).

(b) Normal operating fuel is woody biomass. Emission factors based on AP-42, NSPS, or fuel sample testing (refer to Table 2-3).

(c) Reduction of hydrogen fluoride (HF) can reasonably be expected with dry sorbent injection (DSI). Most of the fluoride emissions are expected to occur in the form of HF emissions. However, it was assumed no DSI occurs for calculation of worst-case estimated PTE fluoride rates.

(d) Maximum annual emission factor provided for informational purposes only. Continuous emission monitoring system (CEMS) will be used to demonstrate compliance with the federally enforceable annual emission limit. Short-term emission estimates are provided for informational purposes only. Ton per year (TPY) estimates based on boiler heat input of 758 MMBtu/hr, appropriate average emission factor (i.e., lb/MMBtu) and 8,760 hours per year. The emission factor employed is a long term average, including curtailment and scheduled outages. Short term emissions may exceed this average factor.

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**
(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

| | | | |
|-------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------|--|
| 1. Pollutant Emitted: NO_x | | 2. Total Percent Efficiency of Control: >70% | |
| 3. Potential Emissions: See Application Document lb/hour tons/year | | 4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year | | | |
| 6. Emission Factor: See Application Document | | 7. Emissions Method Code: 0 | |
| Reference: | | | |
| 8.a. Baseline Actual Emissions (if required): Not Required tons/year | | 8.b. Baseline 24-month Period: From: N.A. To: | |
| 9.a. Projected Actual Emissions (if required): Not Required tons/year | | 9.b. Projected Monitoring Period: N.A. <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years | |
| 10. Calculation of Emissions: See Application Document, Section 2.0. | | | |
| 11. Potential, Fugitive, and Actual Emissions Comment: See Application Document | | | |

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

| | | | |
|-------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------|--|
| 1. Pollutant Emitted: SO₂ | | 2. Total Percent Efficiency of Control: Uncontrolled. Limited by selection of fuel with appropriately low sulfur content. | |
| 3. Potential Emissions: See Application Document lb/hour tons/year | | 4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year | | | |
| 6. Emission Factor: See Application Document Reference: | | 7. Emissions Method Code: 0 | |
| 8.a. Baseline Actual Emissions (if required): Not Required tons/year | | 8.b. Baseline 24-month Period: From: N.A. To: | |
| 9.a. Projected Actual Emissions (if required): Not Required tons/year | | 9.b. Projected Monitoring Period: N.A. <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years | |
| 10. Calculation of Emissions: See Application Document, Section 2.0. | | | |
| 11. Potential, Fugitive, and Actual Emissions Comment: See Application Document | | | |

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS**
(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

| | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------|--|
| 1. Pollutant Emitted: CO | | 2. Total Percent Efficiency of Control: Unspecified. Controlled by good combustion practices. | |
| 3. Potential Emissions: See Application Document lb/hour tons/year | | 4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year | | | |
| 6. Emission Factor: See Application Document Reference: | | 7. Emissions Method Code: 0 | |
| 8.a. Baseline Actual Emissions (if required): Not Required tons/year | | 8.b. Baseline 24-month Period: From: N.A. To: | |
| 9.a. Projected Actual Emissions (if required): Not Required tons/year | | 9.b. Projected Monitoring Period: N.A. <input type="checkbox"/> 5 years <input type="checkbox"/> 10 years | |
| 10. Calculation of Emissions: See Application Document, Section 2.0. | | | |
| 11. Potential, Fugitive, and Actual Emissions Comment: See Application Document . The proposed fluidized bed boiler design provides highly efficient and complete combustion which minimizes CO emissions. | | | |

