



# Air Resources Board



Linda S. Adams  
Secretary for  
Environmental Protection

Mary D. Nichols, Chairman  
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Arnold Schwarzenegger  
Governor

August 13, 2008

Eldon Beck  
Assistant Air Pollution Control Officer  
Siskiyou County Air Pollution Control District  
525 South Foothill Drive  
Yreka, California 96097-3090

Dear Mr. Beck:

We have reviewed the proposed Authority to Construct (ATC) for Roseburg Forest Products, which we received via e-mail on July 14, 2008. Our evaluation also included a review of the following related documents: the April 2008 Draft Environmental Impact Report for the Roseburg Biomass Cogeneration Plant, Appendix C - Air Quality Technical Report, prepared by Golder Associates (Draft EIR), and the Siskiyou County Air Pollution Control District's (District) Technical Review and Evaluation Report dated May 5, 2008. With respect to the health risk assessment (HRA) in the Draft EIR, Air Resources Board (ARB) staff's evaluation included a review of the modeling inputs. Staff did not confirm any dispersion modeling done by the consultant. Our specific comments on the ATC and supporting documents, which staff discussed with you on August 12, 2008, are provided below.

Because we did not receive the full 30 days to review the ATC in accordance with District Rule 6.1 Section G, we are transmitting these comments after the District's specified July 28, 2008, deadline. However, we encourage you to consider our comments before you finalize the ATC.

## Project Description

The applicant proposes to modify the existing biomass boiler at the Roseburg Forest Products veneer manufacturing plant by installing a superheater, a 15-MW steam turbine generator, cooling tower, and support equipment to provide the facility the ability to generate electricity.

The proposed project site is attainment/unclassified for all federal ambient air quality standards and was recently reclassified as non-attainment for the State 8-hour ozone standard (effective July 26, 2007). Proposed best available control technology (BACT)

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and annual emissions, as indicated in the District's technical evaluation, are summarized in the following table:

Air Pollutant	Proposed Best Available Control Technology	Annual Emissions (tpy)
NOx	Fly ash reinjection, combustion controls, and SNCR with ammonia injection, with controlled emissions of 846 lb/day (based on 0.240 lb/MMBtu and 35% SNCR control efficiency)	154

#### Specific Comments

1. BACT for oxides of nitrogen (NOx): The District is proposing selective non-catalytic reduction (SNCR) as BACT for NOx and is assuming a conservative 35 percent NOx reduction efficiency. Selective catalytic reduction (SCR) is reported to achieve greater NOx reductions (as high as 95 percent) than SNCR but was rejected by the District due to concerns over high concentrations of particulate matter that would foul the catalyst and render the system ineffective. ARB staff understands that there may be some challenges using SCR with dirtier gas streams; however, there is a new, patented NOx emission control technology developed by Babcock Power Environmental known as RSCR that is currently being applied on biomass boilers in New Hampshire, Maine, and Vermont. RSCR technology is designed for NOx reduction on tail-end, low-temperature applications and is a combination of a regenerative thermal oxidizer (RTO) and SCR. This technology is applied downstream of the particulate control device. It uses large ceramic bed heat exchangers to bring the flue gas back up to 600-800 °F for catalytic reduction in the RSCR system. This technology claims to have the potential to reduce NOx emissions by as much as 70 percent. RSCR has been installed on three existing biomass boilers in the United States. These sites include:

- 15-MW Whitefield Power & Light, New Hampshire: Boiler uses whole tree chips as fuel and has operated since October 2004.
- 16-MW Bridgewater Power, New Hampshire: Boiler uses whole tree chips as fuel and has operated since October 2007.
- 50-MW Boralex Stratton, Maine: Boiler uses whole tree chips, waste wood, and construction and demolition wood as fuel and has operated since December 2004.

Another application is scheduled to start up in October 2008 at the 54-MW Burlington Electric plant in Vermont. These boilers have permitted NOx levels

ranging from 0.25 to 0.28 lb/MMBtu. The three RSCR installations were installed to qualify for Connecticut Renewable Energy Credits, which require a NO<sub>x</sub> level of 0.075 lb/MMBtu or less on a quarterly average. The unit in Vermont is targeting a NO<sub>x</sub> emission level of 0.065 lb/MMBtu or less for the Massachusetts Renewable Energy Credit program.

ARB staff recommends that the District BACT analysis include an evaluation of RSCR. If the technology is deemed infeasible for this project, ARB staff supports ATC condition #23, which states that the District reserves the right to establish a stricter emission limit based on any future source test results that may show the SNCR system can achieve greater than 35 percent control efficiency.

2. Ammonia slip: ATC condition #25 limits ammonia slip to "25 ppmv on an uncorrected basis." This emission factor should be normalized using a correction factor, which is typically based on some percentage of oxygen or CO<sub>2</sub> in the exhaust gas. In addition, the permit should include a method of verifying ammonia-slip emissions on a regular basis outside of the initial source test, such as monitoring the ammonia injection rate.
3. Criteria pollutant emission limits: In addition to the maximum daily criteria pollutant emission limits contained in ATC condition #23, ARB staff recommends that the District include the emission factors used to derive the daily limits as a permit condition. For example for NO<sub>x</sub>, ARB staff calculated this to be 0.156 lb/MMBtu (or about 121 ppmv at 3 percent O<sub>2</sub> over some averaging period) applying the 35 percent SNCR control efficiency. These emission factor limits become the basis for any future emission calculations and BACT decisions. It is important to note that daily emissions limits are unenforceable using a source test.
4. Project non-cancer risk: The HRA only evaluated excess cancer risk and **chronic** non-cancer risk. It did not evaluate **acute** non-cancer risks. The HRA also did not include ammonia in the evaluation of acute and chronic non-cancer risks. The "Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values" (May 22, 2008) contains both acute and chronic non-cancer inhalation exposure levels for anhydrous ammonia (CAS No. 7664-41-7). Ammonia will be used in the SNCR system for NO<sub>x</sub> emission control; however it is unclear whether anhydrous or aqueous ammonia is proposed. If anhydrous ammonia is to be used in the SNCR system, it should be evaluated for potential to induce acute and chronic non-cancer risks.

5. Toxic emissions from feedstock: Toxic air contaminant (TAC) emission factors used for the HRA only included data from wood-fired boilers burning forest product-related virgin wood chips, sawdust, and shavings. In addition, the Draft EIR states no wood debris containing resin will be burned. This is inconsistent with ATC condition #16 that limits feedstock to unadulterated wood, which includes plywood, particle board, oriented strand board, and other types of wood products bound by glues and resins. If glue- and resin-laden wood products will be used as feedstock for the boiler, previously excluded TACs should be re-examined, and the HRA should be re-run accordingly.
6. Toxic emissions from cooling tower: District Rule 8.4 prohibits adding any hexavalent chromium containing chemicals or any compound that may produce hexavalent chromium to a cooling tower. Although the Draft EIR states that the source will not use any hexavalent chromium as a treatment chemical in the cooling tower, it should be stated as a permit condition to ensure compliance with the rule.
7. Source test frequency: The only specific testing requirement contained in the ATC to verify emission levels is through the initial source test. Although ATC condition #13 reserves the District's right to require source testing beyond what is listed in the permit, ARB staff recommends that the District determine the appropriate initial and long-term source test schedule for the boiler and include that in a permit condition. A continuous emissions monitoring system (CEMS) is required for opacity, NO<sub>x</sub>, CO, and O<sub>2</sub>, so there will be ongoing compliance verification of those pollutants, but there should be a mechanism to periodically verify other pollutant levels reflected in permit conditions.
8. Quality assurance for CEMS: Since a CEMS will be used to verify NO<sub>x</sub> and CO emission rates, the ATC should include more prescriptive requirements to ensure the accuracy of the CEMS unit. For example,
  - calibration, operation, and maintenance of CEMS in accordance with applicable requirements of Appendices B and F of 40 CFR Part 60.;
  - correction basis for pollutants measured; and
  - annual relative accuracy test audit (RATA).

We have included an example permit for a biomass boiler located in a non-attainment area for your information. You may find some of the permit conditions useful for this project.

Thank you for this opportunity to comment. If your staff has any questions, or needs further clarification on any of our comments, please contact Ms. Stephanie Kato, Staff

Mr. Eldon Beck

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Air Pollution Specialist, at (916) 324-1840. If you have any other questions or would like to discuss this further, please contact me at (916) 322-6026.

Sincerely,

*Michael J. Waple for MST*

Michael J. Tollstrup, Chief  
Project Assessment Branch

Attachment

cc: Gerardo Rios, Chief  
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U.S. Environmental Protection Agency, Region 9  
75 Hawthorne Street  
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Shaheerah Kelly  
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