



AIR QUALITY ANALYSIS



DATA ■ ANALYSIS ■ SOLUTIONS

Modeling and BACT analysis for demonstrating PM2.5 compliance

CHALLENGE

Concern for rising oil prices and global climate change has many public institutions considering converting their building heat source from fossil fuel to woody biomass such as wood chips or wood pellets. But the combustion of wood chips presents health concerns over the high levels of fine particulate matter (PM2.5) that wood chip combustion emits. For wood-fired boilers to be a viable heating source, it is critical that such systems are designed to meet the Environmental Protection Agency's recently strengthened National Ambient Air Quality Standards (NAAQS) for PM2.5, as well as proposed Prevention of Significant Deterioration (PSD) requirements and Significance Levels for PM2.5.

INITIATIVE

The Foster-Glocester School District contracted with RSG to develop a design for a wood chip-fired boiler and associated air pollution control equipment for the Ponaganset Middle School, in Glocester, Rhode Island, that would meet federal and state permitting requirements. For this study, we:

- Evaluated a close-coupled, 4.6-MMBtu/hour gasifier, which required a preconstruction permit from the state
- Performed a top-down Best Available Control Technology (BACT) analysis to identify necessary emission controls
- Conducted air dispersion modeling to identify an exhaust stack height and diameter that would provide the plume dispersion needed to meet air quality standards
- Used EPA's AERMOD guideline model to estimate ambient air quality impacts

RESULTS

Our air dispersion modeling identified a stack height for the school that would meet the NAAQS and PSD requirements. A high-efficiency multicyclone was selected as "BACT." Rhode Island's first institutional wood boiler has been permitted, built, and is now operating.



RSG used EPA's AERMOD guideline model to estimate air quality impacts in all terrain regimes, including the building cavity and simple and complex terrains. The study site of the Ponaganset Middle School is relatively flat and surrounded by forests and fields.

Contact Information

For more information about this project, contact:

Mr. John Hinckley
Senior Associate
jhinckley@rsginc.com
888.292.9639