



Best Practices in Wood Waste Recycling

Minimizing Pollution Issues in Hogged Fuel Combustion

Material: Wood Waste

Issue: *There are a number of environmental issues that need to be analyzed when considering the installation or modification of a hog fuel fired combustion system. These could include:*

- *environmental regulations that exist in the location of the proposed facility.*
- *types of existing pollutants already at serious levels in the region.*
- *environmental impact of the system equipment components as proposed.*
- *capability of the latest environmental technology.*

Depending upon the sourcing strategy and quality control steps employed by a boiler fuel purchasing agent, several different types of waste streams may be used in the boiler. Processed wood waste is one such stream. It could be introduced as a blended component with conventional fuels. It would be introduced to cut fuel costs and help keep the boiler operation competitive.

There will be nominal amounts of contaminants in the processed wood, but they are controllable. The fuel purchasing agent and the supplier must work together to insure that between the quality control of the wood waste feedstock and the emissions control system of the boiler, that the actual emissions of the boiler do not exceed the allowable parameters. Such a protocol has been developed and it is specific to each system and each grade of wood waste feedstock that is used.

Best Practice: Air pollution is the environmental impact having the most visible, and potentially the most harmful, side effects. The type of air emissions and the specific amounts depends upon a number of variables which include fuel type and feed rates, furnace design, air/fuel ratio during operation and emission control device.

In order to meet the emission standards of the facility and stay within the confines of the regional or state operating permits for air emissions, a fuel purchaser must be very careful to purchase fuel to meet the boiler specifications. An operator must also carefully monitor the controls of the boiler for optimum furnace combustion temperatures and air flow.

The contamination of water supplies due to the runoff from biomass storage piles can generally be avoided by the use of a sloped storage pad to assure runoff versus the collection and generation of water soluble compounds in the fuel (i.e., organic acids can be created if the biomass is left standing in water for a long period of time).

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Implementation: The major EPA documents relative to the combustion of hog fuel are:

- National Ambient Air Quality Standards (NAAQS)
- Prevention of Significant Deterioration, Clear Air Act (PSD)
- Solid Waste Management Act

The decision to use processed wood waste for fuel is determined by a number of factors that must be considered in concert:

- fuel requirements of the combustion system
- emissions control capability of the system
- costs of traditional fuels within reasonable proximity of the facility
- availability and cost of processed wood waste for fuel
- local ambient air quality conditions and projections on an ongoing basis
- local environmental regulations and standards
- local regulatory authorities' familiarity and awareness of available combustion technologies and best practices.

If the combustion facility is relying on fuel from a multitude of suppliers, the fuel specification will probably be more specialized to maintain permit standards and to minimize wear on fuel handling and combustion equipment. Grate fired boiler systems and the bubbling or circulating fluidized bed boilers systems are the primary firing units used for large wood waste combustion systems.

The PSD regulations have considerable impact on the burning of hog fuel. The automatic control systems alert the operators to any major problem areas at the boiler. The management and quality assurance system involving the fuel buyer and the hog fuel supplier are not as easy to control. It is not feasible to physically examine every piece of wood that is brought to the plant. It is crucial, however, that overall quality of the wood waste stream introduced into the boiler system, be well managed. Air emission monitoring systems are continuously monitoring levels of many different types of pollutants. Significant contamination entering the system from a fuel batch could overtax the system and result in an emission level that could trigger a temporary suspension of burning. Far better to avoid this problem than to have to identify it and correct it after a shutdown.

Benefits: The quality of the hog fuel is critical for both good combustion within the boiler and for compliance with permit requirements for the resulting air emissions and combustion ash. The design of pollution control systems is based upon the size of the unit and the background environmental atmosphere within which it is proposed. However, the advanced air pollution controls systems that can be put on today's boilers allow for some tolerance in the mix of the solid fuels used and provide some opportunity for operator flexibility in fuel selection. It may be possible for more wood waste materials to be ultimately consumed in the combustion process, depending upon the size of the unit and the baseline required level of controlled spec-fuel. This higher cost fuel will be blended with the lower cost wood waste fuel. One possible performance advantage that the boiler operator may realize, is that urban wood waste fuels tend to be dry and do not have " BTU-costly" moisture.

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Application Site: This Best Practice applies to wood-waste processing facilities.

Contact: For more information about this Best Practice, contact CWC, (206) 443-7746, e-mail info@cw.org.

References:

1. Murphy, Mike. Energy Products of Idaho, Boise, ID
2. Wood products in the Waste Stream: Characterization and Combustion Emissions, New York State Energy Research and Development Authority, Albany, New York, November, 1992, prepared by Environmental Risk Limited and C.T. Donovan Associates Inc.

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