

Virginia Department of Environmental Quality  
response to an Appeal  
from plastics burning at the  
Columbia Forest Products facility,  
Chatham, Virginia

The staff of the Virginia Department of Environmental Quality (DEQ), have completed a review of the appeal to halt the practice of burning plastics in the boiler at the Columbia Forest Products facility in Chatham, Virginia.

The appeal was submitted, on behalf of eight citizens from the town of Chatham, to DEQ Director, Mr. Robert G. Burnley, on January 5, 2005.

The appeal alleges that Columbia Forest Products (CFP) is currently burning plastics in their boiler. This action results in emissions of combustion byproducts that are not regulated by DEQ. The appeal raises several issues concerning the CFP boiler, and contains eight sections of supporting documentation, which includes a videotape of boiler emissions.

DEQ staff has attempted to address each of the major issues raised in the appeal, and comment on the supporting documents presented. For clarity major points in the appeal are presented in bold, with the DEQ response underneath.

### **The Boiler**

The boiler at CFP is a stoker-fed unit capable of burning solid fuel and is equipped with both under-fire, and over-fire forced draft air to facilitate good combustion. Although considerably smaller, the CFP boiler utilizes the same principles of combustion as other solid fuel-fired boilers found in the Commonwealth.

DEQ evaluates all emission units installed after March 17, 1972, as "New and Modified" sources in accordance with State Air Pollution Control Board Regulations (SAPCB). The regulations require DEQ to establish Best Available Control Technology (BACT) for controlling emissions from a stationary source of air pollution. BACT for this boiler was established as a mechanical collector (multicyclone) for particulate control. SACPB regulations do not require boilers to have the capability for combusting auxiliary fuels.

There appears to be a misconception that the CFP boiler is capable of only burning at low temperatures. The concept of low temperature combustion, in any boiler, is a misnomer. The operating temperature of a boiler is influenced by a number of variables (steam demand, amount of fuel combusted, type of fuel, radiant heat loss, heat enthalpy, etc.) however the temperature of combustion is directly related to the type and amount of material being combusted. Combined with forced excess air, boilers provide a controlled atmosphere in which the combustion reaction will take place.

### **Wood waste**

Whittle Plywood Corporation submitted a permit application, dated October 22, 1980, to construct and operate a Houston, Stanwood & Cample boiler with a rated heat capacity of 7MMBtu/Hr, using wood waste as fuel. The application states that the facility is a manufacturer of plywood panels for cabinets and that the boiler fuel will be wood waste.

The appeal places emphasis on an excerpt from the engineering analysis which states, "kiln dried wood will be used as fuel." This statement is correct. It is common practice that wood used in the manufacturing of plywood and furniture in general, is first kiln dried to reduce the moisture content and prevent warping in the final product.

The application and engineering analysis both indicate that the boiler fuel would be wood waste generated from the manufacturing of plywood panels. There does not appear to be any misconception that the boiler fuel would be comprised of sawdust, sanding dust, and plywood trimmings from the process. Therefore, Condition 6 of the original permit, dated December 29, 1980, specifies that the approved fuel for this unit is wood waste.

The burning of facility generated wood waste, as boiler fuel, is a conditionally accepted practice in the Commonwealth. DEQ evaluates the proposed fuels for each facility, on a case-by-case basis, to define what types of material may be burned. Because of this, the boiler at CFP is currently prohibited from burning wood waste which contains chemical treatments, paper, or plastic laminates. The term "chemical treatments" is intended to refer to pressure treated lumber containing creosote, chromated-copper arsenate, or pentachlorophenol solutions. Paper, and plastic laminates are specifically omitted from the approved boiler waste fuel. Based on the evaluation of the type of products used and the potential to emit, both criteria and hazardous pollutants, DEQ considers this definition of wood waste to be appropriate for CFP.

### **Burning of Plastics**

One of the primary focal points in the appeal is the allegation that plastics are being burned in the CFP boiler. Much of the supporting documentation consists of product information, material safety data sheets (MSDS), and various publications (including newspaper articles, laboratory studies on combustion of plastics, and chemical abstract sheets (CAS)). The appeal contends that combustion of wood products, burned in the CFP boiler, produce byproducts that include formaldehyde, acrolein, hydrogen cyanide, ammonia, and carbon monoxide. DEQ concurs, that with the combustion of any fuel (gaseous, liquid, or solid) byproducts of combustion are emitted to the atmosphere. However, DEQ does not agree that plastics are being combusted in the CFP boiler.

Manufactured wood products (MWP), such as plywood, fiberboard, or oriented strand board, are comprised of a variety of constituents including veneers, wood chips, wood fibers, glues or resins. Although a particular type of glue or resin may contain polymers, the resulting product is classified as a manufactured wood product. It is not classified as plastic.

The appeal attempts to equate information contained in the MSDS sheets, with actual emissions from the boiler. This approach misrepresents the intent of the MSDS sheets and does not adequately reflect boiler emissions. MSDS sheets, as required by the Occupational Safety and Health Administration (OSHA) regulations (§ 1910 et seq.) and the federal Emergency Planning and Community Right to Know Act (EPCRA), were designed to inform workers of the potential health hazards associated with exposure to bulk quantities of chemicals. The MSDS lists Threshold Limit Values (TLV) for exposure to bulk chemicals, precautions for handling of chemicals, and recommended waste disposal methods. MSDS sheets were also intended to inform firefighting crews of potential hazards associated with a fire, or open burning incident, involving various bulk chemicals. The potential health hazards, and effects on humans, of combustion byproducts are associated exclusively with an open fire event. MSDS sheets cannot, and more importantly, should not be used in an attempt to quantify emissions from the controlled combustion atmosphere of a boiler.

The appeal also references laboratory studies, intended to identify compounds emitted from the combustion of various plastics, and manufactured wood products. DEQ believes that the purpose of these studies was to identify compounds associated with the combustion of various materials. Further review indicates that many of the conclusions drawn from these studies, were based on laboratory conditions that included simulating open burning or accidental fire. A significant number of laboratory studies have been conducted over the years to enable the USEPA to evaluate emissions being discharged to the atmosphere from various sources.

From studies, such as those referenced, the USEPA (under §112 of the federal Clean Air Act) has compiled a list of hazardous air pollutants (HAP) and has developed sector-based initiatives to control and reduce emissions of HAP. These initiatives require the use of Maximum Achievable Control Technology (MACT) at affected facilities, to control certain processes and emission units. Facilities that are not covered by a MACT standard (or for which a standard has yet to be established) may still be evaluated for HAP emissions under SAPCB regulations.

The CFP boiler is currently not subject to a MACT standard, however DEQ has evaluated HAP emissions from the boiler for both threshold limit values (TLV) and Significant Ambient Air Concentrations (SAAC). The TLV refers to the maximum airborne concentration of a substance to which the American Conference of Governmental Industrial Hygienists (ACGIH) believes that nearly all workers may be repeatedly exposed, day after day, without adverse effects. SAAC refers to the health-based standard, established by Virginia's air pollution control regulations, to evaluate the

concentration of a toxic pollutant in the ambient air that if exceeded may have the potential to injure human health.

In the course of evaluating boiler HAP emissions, DEQ staff used all available USEPA approved techniques. Actual boiler fuel usages was compared with the USEPA compendium of emission factors found in AP-42, predictive computer modeling was performed on the CFP boiler stack, air sampling was conducted from the plant area (including the UV finish line exhaust vents), and an ambient air toxics monitoring station was established in a public area adjacent to the facility. All results, when compared with both TLV and SAAC limits, were found to be below the standard for ambient air concentrations.

As a follow-up, DEQ forwarded a copy of the sampling analysis to Dr. Ram K. Tripathi, a toxicologist with the Virginia Department of Health's Division of Health Hazards Control. Dr. Tripathi stated in his response, dated January 25, 2005, that "Analytical results indicate the average concentrations of VOCs are below the level at which any known health effects are seen." Although Dr. Tripathi called the compounds VOC (volatile organic compounds) instead of HAPs, the point should be taken that ambient air concentrations of these compounds were not being emitted at a level that would cause the Virginia Department of Health to be concerned.

DEQ has concluded that there is no indication of HAP emissions being emitted at levels that exceed any applicable state, or federal standard. Therefore, DEQ has no reason to alter the definition of wood waste for this boiler.

### **Bhopal**

The appeal attempts to draw an analogy between CFP boiler emissions, and the incident at Bhopal, India. As previously stated, DEQ has evaluated HAP emissions from the CFP boiler and has concluded that emissions are within applicable standards.

The incident at Bhopal involved the release of methyl-isocyanate gas from a storage tank. Methyl-isocyanate is not stored or used at the CFP facility.

### **Boiler Visible Emissions**

The appeal included a forty-five minute video recording of boiler emissions, during various atmospheric conditions on different days. Condition 17 of the current boiler permit states; "Visible emissions from the boiler shall not exceed 20 percent opacity as determined by EPA Method 9 (references 40 CFR 60, Appendix A) except during one six-minute period in any hour in which visible emissions shall not exceed 30 percent opacity. This condition applies at all times except during start-up, shut-down, or malfunction."

Although the video does record visible emissions from the boiler, the observation requirements of EPA Method 9, do not provide for visible emission evaluations from photographs or video recordings. In addition, EPA Method 9 is quite specific with regards to the position of the stack in relationship with the sun, the availability of a contrasting background, and the point at which visible emissions should be observed. Due to these requirements, DEQ staff is unable to make a compliance determination from this video.

SAPCB regulations provides for one, six-minute period per hour when visible emission may exceed the 20 percent opacity limit. In order to document a violation of an opacity standard, DEQ staff are required to conduct an eighteen minute visible emission evaluation. This action would document the existence of two, six-minute periods in an hour where visible emission exceed the opacity standard. With the exception of one, nine-minute segment, the video is comprised of one to two minute segments of boiler emissions either from the stack, or drifting through an area. Therefore, the video is inconclusive as to whether these boiler emissions are conditionally exempt under SAPCB regulations.

The video does, however, indicate that there may be times when the boiler is not being operated in a manner consistent with good combustion practices. DEQ regional staff have recently performed visible emissions evaluations on this boiler and are following up with plant personnel on this issue.

There is currently no restriction on the amount of fuel combusted, or the hours of operation for the boiler. The fact that the boiler is operated during the weekend does not violate any current permit limitations.

DEQ takes all complaints, and allegations of non-compliance, very seriously. Regional staff attempt to investigate all complaints in a timely manner, and to pursue enforcement actions when appropriate.