

1. Comment: It appears to us that a new **boiler stack should be significantly taller** than either the present or the proposed stack.

Response: To maintain acceptable air quality, the state's regulations include pollutant limitations or standards that establish maximum acceptable ambient air concentrations at levels protective of human health and welfare. One method used to assure that these standards are met is the requirement for a facility to obtain a permit before making changes that may affect air quality. More specifically, a requirement of the permit process is a determination that the proposed change will not cause an air quality standard to be exceeded. The tool used to make such determinations is a computer based program that establishes the probable worst-case dispersion characteristics of the pollutant plume and can predict the concentration at locations away from the plant. The DEQ understands that stack height can have a significant affect on the impact air pollutants have once they have been emitted. Staff also recognizes that this issue has been raised previously by citizens concerned over the air pollutant emissions from this facility. As a result of these concerns, DEQ evaluated the modeling submitted as part of the application and conducted additional modeling to address the impact changes that could result from using different input assumptions. The computer model that was run has been developed by the EPA as a screening tool to give conservative results, that is, the results are in almost all cases higher than those obtained from more refined modeling. The model takes into account elevation below the stack height ("simple terrain"), elevation above stack height ("complex terrain"), downwash from structures near the stack, meteorology, fumigation, and other factors. If the "urban" option is chosen instead of "rural", the model does not perform the fumigation calculations; therefore, the rural option is chosen. If downwash from any nearby structures takes place typically the concentration near the structure is increased at elevations below the stack height. As the plume from the stack disperses downwind of the emissions point, it mixes with the surrounding air and the concentration decreases the further downwind the plume travels.

In accessing impact of the emissions of the proposed boiler on the surrounding area the analysis was done assuming a base elevation of 640 feet, as is shown on your attachment 1A-05. This same attachment shows the homes to the east to be at an elevation of 680 feet. Results of the model at the distance of the homes to the east of the facility were obtained at stack height, at 10 feet above stack height and at 20 feet above stack height. Modeling was performed assuming an emission rate of 1 pound per hour so that the results could be prorated for any pollutant. The modeling done for the draft permit prior to the public notice used a stack height of 40 feet as proposed in the source's application. Results of this modeling showed a maximum concentration of  $30.37 \mu\text{g}/\text{m}^3$ .

The DEQ has discussed stack height concerns with CFP and CFP has agreed to ensure that the stack height is a minimum of 5 feet greater than any structure in close proximity to the boiler stack. Height for the proposed fuel silo to go with the proposed new boiler is estimated to be 60 feet. The draft permit has been changed to include the requirement that the boiler stack be 65 feet tall or 5 feet taller than any adjacent structure, whichever is greater. Using this requirement modeling was performed again using a stack height of 65 feet. This modeling showed a maximum concentration of  $18.9 \mu\text{g}/\text{m}^3$ .

There is the potential for injury to human health if the Significant Ambient Air Concentration (SAAC) of a toxic pollutant is exceeded. There are both annual and hourly SAAC values for most toxic pollutants. In order for acrolein's annual SAAC to be exceeded, the maximum modeled concentration would need to be  $114.09 \mu\text{g}/\text{m}^3$  or greater. For formaldehyde's annual SAAC to be exceeded the maximum model concentration would have to be  $158.74 \mu\text{g}/\text{m}^3$  or greater. To exceed the hourly SAAC for acrolein or for formaldehyde the model concentration would have to exceed  $330 \mu\text{g}/\text{m}^3$ .

The comments recommend a stack height with a minimum of 65 meters with reference to the regulatory definition of Good Engineering Practice (GEP) as it applies to stack height. It appears that the commenter may have taken the definition out of context as it is applied in the body of the regulation. For the proposed boiler, the stack height requirements of 9 VAC 5-50-20 H applies and stipulates that "the degree of emission limitation required . . . for control of any air pollutant shall not be affected in any manner by . . . the stack height that exceeds good engineering practice . . ." In other words, a facility can not use dispersion modeling on a stack height greater than GEP in order to avoid installing control techniques that would provide for compliance with air quality standards. Or, if a facility wishes to use the dispersion of a stack height greater than 65 meters to meet air quality standards, they must show such a height is needed due to topography, structures or some other feature that disrupts normal dispersion (causes downwash) from a stack. Therefore, in the context of how the term GEP is used in the regulation, any stack height of 65 meters or less would be deemed as complying with the provisions for GEP stack heights at new sources. Again, what is critical to the protection of health and welfare as associated with stack height is that the dispersion model, taking into consideration the topography, structures and stagnant air conditions predicts no concentration in excess of ambient air quality standards or guidelines. This modeling has been completed for this project and predicts compliance with applicable standards at the stack height proposed in the application.

2. Comment: We are still unconvinced of the safety of large-scale burning of the long-chain polymers contained in the process wastes used as fuel: urea-formaldehyde resin, polyurethane resin, and acrylic stains and finishes. It is our understandings that **most states categorize these types of waste fuels as "treated wood,"** whereas

this permit seems to continue considering the waste fuel as equivalent to clean wood. It is our position that for safe operation in this situation, the permit should at the very least require continuous **carbon monoxide monitoring** for correlation with air toxics caused by incomplete burning.

Response:

Like the resins and finishes involved in this process, cellulose which is a major component of wood, is also a long chain polymer. The length of the polymer chain is not a factor for safety, but what is relevant to emissions, and the associated safety of using any material as fuel, is the chemical composition of the fuel and the efficiency of combustion. For the purpose of the draft permit, chemical composition and combustion efficiency were taken into account in the selection of emission factors that were used to project the emissions from the proposed boiler.

The DEQ confirms that the review undertaken in preparation for the draft permit did take into consideration that the proposed fuel for the boiler is the residue of the plywood production facility and that this residue includes cured resin and finishes that are introduced into this residue as part of the board manufacturing process. The emission factors used to estimate emissions for this assessment were selected from several different resources and took into consideration the implications of burning wood with these non-wood components. The assessment involved more than treating this fuel as unadulterated wood. The typical process of estimating emissions for permit review purposes is to assess the available emission factor information for a given emissions unit and select what is considered the most representative. Because this process must be completed prior to the construction or operation of the permitted unit, there frequently are no exact matches and in many cases estimates must be based on data that will approximate the permitted unit. In such cases emissions testing, after the facility is operational, is often used to validate assumptions made during the permit development process. The proposed permit for CFP does include such emissions tests.

The DEQ review of available emission factor resources indicates that use of wood-based fuel (fuel that originates predominately from wood products and includes non-wood components) is a practice in many parts of the country and that emission factors are available for use of such wood-based fuels. As found in documents covering the use of this material as fuel, this type fuel has been given a number of different designations (e.g. wood, wood waste, treated wood, scrap wood, reclaimed wood, wood residue, adulterated wood, etc.). Concerning the DEQ's selection of emission factors for the CFP permit, the development documents for the federal boiler standard that was promulgated September 13, 2004 (40 CFR Part 63; National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters) are relevant to this process. Information concerning testing and categorization of fuel

types show that a number of emissions tests were done on boilers firing wood-based fuels, including fuels which contain plywood or furniture manufacturing residue. Documentation confirms that the "wood" category for this standard includes "dry wood products", "timber products" and "treated wood." Emission factors for wood fuel as presented in this regulatory development process therefore do account for and include fuel with non-wood constituents. The DEQ did evaluate these factors for use in estimating the emissions from CFP and did use these factors when they resulted in a larger rate of emissions as compared to other factors. There is nothing to indicate that the residue CFP is burning is unique with respect to other units burning similar fuel and therefore use of emission factors from the development of this standard are appropriate for predicting emissions when assessing the safety of burning this fuel.

Also considered by DEQ when estimating emissions for the proposed CFP boiler was an evaluation titled "Wood Products in the Waste Stream: Characterization and Combustion Emissions" (Prepared for the New York State Energy Research and Development Authority by Environmental Risk Limited and C.T. Donovan Associates, Inc., November 1992). (Excerpts of this study were included in your comments as attachments 2A-01, 2A-02 and 2A-03). One of the "Key Findings" of the study, as presented on page 8-2, states:

"Relatively few sources of emissions data were found on combustion of C/D, railroad ties, telephone poles or other 'treated' wood. Comparison of these data with those from 'clean' wood combustion at the same sources indicates that organic emissions are generally not increased from combustion of 'treated' wood. While metals emissions data from these sources were very limited, the data indicate only slightly higher level for 'treated' wood."

This study appears to reach a conclusion equivalent to that used by the developers of the Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters (Boiler MACT); "treated wood" is "wood" for the purpose of estimating emissions. In summary, the DEQ believes that the emission factors used to estimate emissions for the review of the CFP boiler are appropriate for the fuel, including the identified resins and coatings, and that use of such emission estimates along with modeling is a valid method to assess the safety of this practice as compared to established standard and guidelines. In addition, if the boiler is permitted and built, the permit requires emission testing of selected pollutants to provide further verification of the assumptions used in the selection of emission factors.

The comments indicate that the new boiler with its larger fuel capacity represents a "sharply increased risk." The comments do not provide any specific risk assessment information to support this position and therefore DEQ is making the assumption that this comment is based on a belief by the commenter that a substantial increase in fuel consumption will equate to a substantial increase in

risk. The DEQ understands that, with all other things held constant, use of additional fuel does predict an emissions increase that is directly proportional. However, this increase usually does not result in a directly proportional increase in risk. In addition, as with any situation that incurs risks, an evaluation is conducted to assure the risk after the increase remains at an acceptable level. The air pollution permitting process addresses risks through its assessment of the air quality impact as compared to established air quality standards. As previously indicated the assessment for this permit, including this increased fuel consumption, indicates that boiler emissions will not jeopardize an air quality standard.

To provide a conservative assessment of emissions and the resulting impact, the DEQ's assessment of boiler emissions does treat the boilers as equivalent with respect to the emission factors. It is important to note however that the proposed boiler does incorporate design features that should improve combustion efficiency as compared to the existing boiler and provide for reduced emissions per unit of fuel consumed. The proposed boiler is designed for staged combustion and has an underfeed fuel delivery system. The staged combustion design addresses the high volatile characteristic of wood-based fuel by introducing the necessary combustion air at different locations within the unit so that these volatile gases are combusted instead of being emitted in the form of an organic pollutant/smoke. The current boiler uses an overfed system that blows new fuel into the firebox over the fuel bed. This arrangement is thought to allow a portion of the fine fuel particles to become entrained in the boiler exhaust and leave the firebox as partially combusted char. While the majority of this material will be captured by the particulate control device, some will be emitted. The underfed stoker addresses this concern by incorporating these fine fuel particles directly to the fuel bed. Also, with the overfed system, the fuel is added on top of the fuel bed which to some extent may smother the fire (restricts combustion air to the burning fuel bed decreasing combustion efficiency) and quench the fuel bed (cold fuel lowers the temperature of the fuel bed and decreases combustion efficiency). The underfed system is designed to address these combustion concerns by introducing new fuel to the bottom of the fuel bed. Not only does this physically keep the new fuel from smothering and quenching but the design also provides that the new fuel is preheated as it pushes up through the bed and volatiles produced during this pre-combustion and early combustion phases then pass through the hotter combustion area near the surface fuel bed where they are more likely to be consumed. Thus, actual emissions as estimated from the average emission factor should be representative for the existing boiler but it is anticipated that the proposed boiler's emissions will be lower than those calculated from the average emission factor.

In addition to differences in design which should improve combustion efficiency, the proposed boiler will have a higher stack height as discussed in the response to Comment #1 when compared to the existing boiler and therefore the impact on air quality from the two boilers is not equivalent. To further assess how this factor

affects emissions, the impacts from the two boilers were compared and even with the higher emissions rate estimated from the increased fuel consumption, the impacts are predicted to be higher, at locations off of the plant property, from the old boiler.

The DEQ agrees with the commenter that good combustion efficiency is necessary in order to minimize emissions. Good combustion practices are also a requirement of the state's regulations and covered in the permit through requirements for operations manuals, maintenance plans, operator training and an opacity standard. Based upon staff review it does not appear that the use of this type manufacturing residue for fuel by CFP, makes this boiler more susceptible to combustion problems nor does it indicate that the combustion byproducts would be substantially different as compared to use of unadulterated wood as boiler fuel. As suggested in the comments, the DEQ has considered a requirement for use of a carbon monoxide monitor. The DEQ agrees that such a monitoring system could provide the facility with valuable information concerning combustion efficiency and related emissions. The staff also notes that the presence of visible emissions, as with those documented for the current boiler at CFP, provide an indication of combustion efficiency. However, systems to continuously monitor either of these parameters are relatively expensive when contemplated for such a small boiler. For pollutants that are related to incomplete combustion, DEQ notes that EPA development of the boiler MACT did consider use of carbon monoxide monitoring for the same purpose as represented in the comments. Using cost information that is part of the background document for the MACT, the federal regulation concluded that carbon monoxide monitoring is not appropriate for new boilers burning wood, including treated wood, that are less than 100 million Btu/hr heat input. The proposed unit at CFP is 12.6 million Btu/hr heat input. Based on all the available information gathered by staff, the DEQ does not find any factors unique to the CFP boiler or fuel that would warrant carbon monoxide monitoring.

The permit does include a test requirement for initial performance testing for carbon monoxide and an assessment of visible emission during the initial performance test. This test will confirm that the unit's design will achieve good combustion of the fuel permitted. The DEQ will continue to use visible emissions observations as a means to assess combustion efficiency. The language of the draft permit has been adjusted to more clearly state CFP's obligation to maintain and operate the unit using good combustion practices.

3. Comment: We continue to **question the categorization** of this facility as a **synthetic minor source**, rather than as a major source.

Response: Based on the comments and background information presented, the DEQ understands your concerns are focused on classification with respect to hazardous air pollutants. Therefore, the determination of whether or not the facility falls

within the classification of "major" is based on the definition of "major source" as found in 40 Code of Federal Regulations 63.2:

*Major source* means any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants, unless the Administrator establishes a lesser quantity, or in the case of radionuclides, different criteria from those specified in this sentence.

There are two conditions in the permit (numbers 16 & 17) that in conjunction with the record-keeping requirements, places federally enforceable limits on emissions of hazardous air pollutant to levels below the 10/25 TPY threshold and allow the source to operate as a non-major source.

The comments reference and include an updated version of concerns presented to DEQ during a meeting on July 19, 2005. As indicated in the comments, this version of the July 19, 2005 document includes references to specific background documents and DEQ also notes some word substitutions have been made. DEQ has reviewed these background documents and observes that DEQ's response to these issues (3C-01, 3C-02, 3C-03) as well as the documentation of DEQ internal assessment of these issues (3C-04, 3C-05, 3C-06, 3C-07, 3C-08, 3C-09, 3C-10) is included as part of the background documentation for your comments on the draft permit. DEQ appreciates the opportunity to review these background documents as referenced to specific areas of concern. As demonstrated by these references, the DEQ staff took a great deal of time and consideration in reaching the determination that CFP is a synthetic minor source.

As recognized in your comments, the use of resins is the largest contributor to potential emissions of hazardous air pollutants. The method used in the current permit, as well as the proposed permit, establishes a limitation on annual emissions from the use of resins (Condition 16) which serves as one component of a plant-wide limit on emissions of hazardous air pollutants. This limitation is used to establish the potential emissions of formaldehyde and methanol at a level that does not exceed 10 tons per year. The combination of this limit with the unrestricted potential emissions from the proposed boiler establishes the potential to emit for formaldehyde at a level below the major source threshold. With respect to methanol and formaldehyde emissions from the use of resin, Condition 17 is also applicable. In other words, the facility-wide limitation established by Condition 17 covers the entire facility, including the hazardous air pollutants from use of resins. CFP must comply with both of these limitations.

Compliance with limits such as these is determined through record keeping which may rely on emission factors and/or product information that is evaluated by DEQ on a case-by-case basis. The DEQ understands that the volume of data relevant to hazardous air pollutant emissions, the differences in this data, and the changes in the product information associated with resin use are worrisome to the commenter. However, the evolution of emission estimates as documented for

CFP is a common and expected occurrence in the air pollution regulatory program. Also of concern to the commenter and of significant concern to DEQ is CFP's use of resins that were not covered by the previously supplied certified product data sheet. Staff's assessment of this situation has led us to conclude that the language of the current permit is not adequate with respect to product data. The proposed permit addresses this issue through obligation of the facility to obtain vendor certification or independent testing of the hazardous air pollutant and volatile organic compound content of each shipment of resin (Condition 25f). With respect to past use of resin not covered by the certified product data sheet, DEQ has evaluated information relevant to the impact of the use of these other resins on actual emissions and concluded that this information does not indicate actual emissions above the major source threshold.

It is important to note that, at CFP as well as with most manufacturing processes, it is not possible to measure the actual emissions for comparison to the major source annual threshold. Continuous emission monitors are not available for many hazardous air pollutants and, in cases such as the resin-related emissions at CFP, it would not be possible to capture all of the emissions for measurement even if monitors were available. Therefore mass balance from product content data or extrapolations from laboratory scale evaluations or short-term emissions test are used to predict actual annual emissions. When selecting such data it is necessary to consider how well the tests/data reflect the actual operating conditions. One example relevant to the determination of emission from resin is the use of the lab information from Borden dated November 17, 1995. This evaluation, intended to provide data on formaldehyde emission over time at elevated temperature associated with pressing, found that "... the formaldehyde emissions reach 50% of free formaldehyde in the resin after 1-2 minutes, 100% at 5 minutes and 300% in 60 minutes. The last figure is explained by hydrolysis of methylolurea present in the resin." Based on this data, the comments to this draft permit suggested that the appropriate use of this information estimates formaldehyde emissions to be 300% of the free formaldehyde content. The agency notes however that, based on production information, the average press cycle (amount of time that the resin is subjected to elevated temperature) is less than 5 minutes and therefore use of the 100% factor should provide a conservatively high estimate of actual emissions. Furthermore, the information presented indicated that emissions greater than the 100% factor are as a result of elevated temperature for a duration sufficient to cause the degradation of a resin component. Since the 300% factor is based on an operating scenario that could not be reasonably expected to occur at CFP, it does not present a valid means of estimating actual or potential emissions from CFP. In consideration of how such information is considered when estimating actual or potential emissions, DEQ is guided by a past court decision and resulting federal guidance. In the case of the US -v- Louisiana-Pacific Corporation (US Court for the District of Colorado, March 22, 1988), the court rejected EPA's position that potential to emit "means the maximum emissions that a source can possibly generate, regardless of whether it is being operated as designed." Instead the court's decision confirms that

maximum emissions are based on operations that are consistent with design or intended use of the source.

4. Comment: It appears to us that the draft permit continues the practice of using **AP-42 factors** for calculation of emissions. The AP-42 document itself states that **EPA does not recommend this practice.**

Response: The selection of emission factors for the purpose of evaluating impact and establishing permit limits was covered to some extent in the response to comment 1.

As a part of the application process stack test information for similar boilers was requested from the source and was submitted to DEQ on July 15, 2005. The tests submitted were primarily for particulate emissions. The AP-42 factors for wood-fired boilers were developed by EPA from a small sample of stack test information. In developing its regulation for boilers at sources that are major sources for HAP emissions, the EPA was able to request and obtain a much larger set of emission test information. In developing the permit the emission factors from this larger set of tests were compared to those in AP-42. Therefore, development of this permit did not rely solely on the emission factors in AP-42. As also indicated in the comments, the rationale behind EPA's recommendation is that use of such factors may result in the inability of an emission unit to meet its permit-prescribed limitations. However, taking the rationale for the recommendation into consideration and in the absence of information to indicate otherwise, staff generally assumes that a modern emission unit will be able to perform at an emission rate that is equivalent to the average in AP-42. The comments recommend that emissions limit be based on testing of the actual emission unit. As explained in response to previous comments, this is not possible due to the regulatory requirement that the evaluation be completed and the permit issued before the facility installs or operates the proposed boiler. Additionally, the permit is requiring the source to conduct compliance emissions tests for particulate matter, carbon monoxide, acrolein, and formaldehyde. These tests will provide an indication of the validity of the factors selected.

5. Comment: It furthermore appears that the draft permit **does not address discrepancies in the present permit involving emissions from the application of glue.** These discrepancies would seem to indicate a higher current level of emissions than are included in both the present and the proposed permits.

Response: In the current permit the source is not required to verify the HAP content of each shipment of resin received. The DEQ agrees with the comments that past practices have not provided the level of product data that DEQ anticipated to support the calculation of actual emissions. Consistent with the recommendation offered by the comments, the proposed permit requires CFP to obtain vendor

supplied information representative of each shipment of resin received (see number 25f) or to obtain independent analysis of each shipment. Previously the source was required to maintain records to show emissions from the resin. The proposed permit adds the stipulation that DEQ approve the calculation methods (see number 25e). It also stipulates that the calculations are to be more comprehensive in covering emissions from the entire facility. The combination of these two record-keeping requirements are intended to make the reports from the source easier to read and provide clarity in the manner the calculations are performed.

6. Comment: We are advised by the Virginia Department of Historic Resources that ours and other historic Chatham properties qualify for consultant status under **Section 106 of the National Historic Preservation Act, regarding atmospheric and noise conditions** involving Columbia Forest Products' equipment. We await further information and resolution of this question.

Response: The determination of Section 106 applicability is not a decision that can be made by either DEQ or the Virginia Department of Historic Resources (DHR). Section 106 of the National Historic Preservation Act requires that the head of a federal agency having direct or indirect jurisdiction over a federal undertaking, federally assisted undertaking in any state, or prior to the issuance of any license, "take into account the effect of the undertaking on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register." Prior to the delivery of these comments, the DEQ was made aware of this issue by copies of requests sent by numerous citizens of the Chatham community seeking consultation status under Section 106 for review of the permit DEQ has proposed for CFP. DEQ is aware that EPA has responded to these requests, advising that the permit under consideration for CFP is not subject to the 106 process.