

Stack Height Considerations

Columbia Forest Proposes 40-ft. Stack Height

In the May 27, 2005 Form 7 (Modification to Stationary Source Permit), SECOR proposes that the new boiler stack be 40 feet in height, the same as the present stack. It is our understanding that by moving the stack to a different location on the Columbia Forest Products property, the base will be approximately 7 feet higher than at present.

40-ft. Stack Height is Insufficient

The proposal for a 40-foot stack is problematical in several ways:

1. There are several structures at the plant (involving the dust collection and distribution system) which loom high above a 40-foot stack, and can be seen to interrupt the air flow around the stack (1A-01). The area is also surrounded by large trees on hillsides. The trees are significantly higher than both the stack and other plant structures; the nearby treelines contain both deciduous and evergreen trees, and appear to stand 80 to 120 feet above the proposed stack base (1A-02, 1A-03, 1A-04). Besides the obvious air flow and plume dispersion problems posed by the proposed stack location, it also appears that obtaining an opacity reading from the stack plume would be quite difficult, since it is obscured behind large structures and below a hill and its tree line.
2. The plant is in a significant valley on the west side of town. A USGS topo map of the area (1A-05) shows that the ground level of residential area beginning about 500 feet east of the stack, and therefore downwind, is about 60 feet above the ground at the factory, thus about 20 feet above the top of both the present stack and the proposed stack. Residential areas continue into the center of town and beyond. At the center of town, 1250 feet east of the plant, the ground level is about 100 feet above the factory (1A-06). About 2500 feet east of the plant, at Chatham Hall prep school, the ground level is about 140 feet above the factory (1A-07). Smoke from the present stack often fills the valleys and covers the residential areas as it pushes uphill into town.
3. The proposal indicates that the location is "rural." That designation seems quite inappropriate, since the plant is within the western town limits of Chatham. The population of the town, two prep schools (Chatham Hall and Hargrave Military Academy), and the business district are all uphill, downwind, within a few hundred feet as noted above, and subject to receiving the smoke from the stack.
4. The proposal indicates that the topography is "simple." That description also seems quite inappropriate, since the stack position could be described as being "in a hole," not only with regard to surrounding factory structures and wooded hillsides, but especially with regard to the town and its residents to the east of the plant.

Present Stack Height Results in Frequent “Fumigation”

The factory is located in a deep valley, with building and (massive) equipment obstructions as well as nearby hillside and treeline obstructions. (It is difficult to believe that the pre-permit stack modeling exercises, resulting in a plan only offering increased stack velocity from a narrower stack, took into consideration all these very significant and obvious obstructions, plus the frequently-observed atmospheric layering at the approximate elevation of the valley’s rim.) This problematical location results in frequent “looping” and “downwash” of the boiler stack plume (1A-09, 1A-10), as was shown in episodes in a videotape accompanying our January 5, 2005 “Appeal of plastics burning” Even more frequent and problematical are the “fumigation” episodes (1A-09), also shown in the videotape, which affect large areas of Chatham: much of the time an inversion layer traps the plume near the level of the surrounding obstructing hilltops, and causes the pollutants from the boiler stack to fill the air near the ground downwind from the stack, which is typically within the residential area just to the east of the factory. It is evident that a taller boiler stack is needed so that the release will occur within the inversion layer, rather than trapped below it (1A-09, 1A-11), and so that the dispersion can occur over a much wider area and higher altitude.

65-meter Stack Height Seems to be an Appropriate Range

Nearby obstructions and land features, and the presence of nearby residents, indicate that by both criteria 1 and 2 of Virginia Administrative Code 5-10-20, the height of the stack should be 65 meters or more. An informal estimate of the typical inversion layer is consistent with this conclusion; a professional meteorological survey should be accomplished to verify the accuracy of this observation.