

Murray, William. *Pulp and Paper: the Reduction of Toxic Effluents*. Library of Parliament Research Branch. Ottawa, Canada: Canada Communication Group, 1992. (Reviewed by Aimee Furber)

Murray reviews the history of paper making, the sources of pollution from the pulp and paper industry, and methods used to control pollution. Wood is made up of about 50 percent cellulose, 25 percent hemicellulose, a bonding agent, and 25 percent lignin, which provides the strength. About 1.5 to 5 percent of wood contains resin acids, fats, waxes, terpenoid compounds, tannins, flavonoids, stilbenes, and tropolines. If enough of these compounds accumulate from the mill effluent in a waterway they can significantly reduce the quality of water and marine habitat.

Pulping is used to free the cellulose from the rest of the wood. Originally sulfite pulping was used, which resulted in the spent sulfite-liquor and other wastes being dumped into the mill effluent. The Kraft process recovers the spent liquor, including tall oil, turpentine, bioenergy, and recycles inorganic compounds. This reduced the amount of mill effluent dumped into waterways.

Polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzo-p-furans (PCDFs) have been noticed in pulp mill emissions. These can come from the burning of condensed spent liquor or be produced in the pulp bleaching and then released in the mill effluent. Research is currently being done about how to reduce PCDD and PCDF levels.

Besides in-plant waste treatment, the use of end-of-pipe treatment processes would greatly reduce the amount of pollution dumped by mills. By establishing sequential anaerobic-aerobic waste water treatment facilities the mills can degrade chlorine ions and mutagenic and chlorinated aliphatic compounds which are known to be carcinogenic.

Critique

This source provided useful background information about pulp mills and helpful recommendations about what can be done to continue to reduce toxic mill effluents. This is important to consider in the Willamette Valley where a major source of industry is pulp and paper mills. These mills are highly polluting in many forms. Information about ways to mitigate pollution can eventually lead to the implementation of more environmentally friendly mill processes.

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