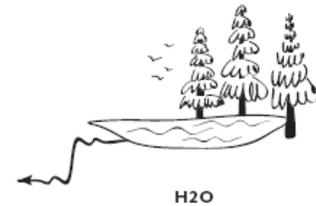


# ENVIRONMENTAL FOOTPRINT COMPARISON TOOL

A tool for understanding environmental decisions related to the pulp and paper industry



## EFFECTS OF NON-WOOD FIBER USE ON WATER USE

### Process Water Needs

Commonly cited agricultural fibers, straw and kenaf bring to the paper manufacturing process disproportionate amounts of short fiber. Though this is sometimes an advantage for some grades, the poorer drainage properties of shorter fiber require more dilute fiber furnishes and a commensurate increase in process water requirements. Figure N1 presents effluent flows that correspond with relative water use.

Bleached chemical pulps	Kenaf		Softwood
	Kraft [1]	Soda [2]	Kraft [3]
<b>Effluent flow (gallons per air-dried ton of</b>	36,000	20,000	18,700
<b>Effluent Quality (kg/air-dried metric ton of</b>			
Biochemical oxygen demand	1.5 - 2.3	5.8	0.3 - 6.7
Chemical oxygen demand (COD)	18.0 - 22.5		14.4 - 72.8
Total suspended solids (TSS)	3.0 - 4.5		0.2 - 9.8

**Notes:**

All three mills have secondary treatment.

[1] The Phoenix mill produces market pulp from wholestalk kenaf. Reported treatment efficiencies are 97% for BOD and TSS and 87% for COD. V. P. Leekha and S.K. Thapar, "Experiences in Kenaf Pulping in Thailand," *TAPPI Proceedings of the 1983 Pulping Conference* (Atlanta: TAPPI Press, 1983) pp. 288-293.

[2] Sandwell Inc, *Kenaf Assessment Study*, draft report prepared for the Tallahatchie Board of Supervisors, Charleston, Mississippi, April 19, 1991, p. 16.

[3] Effluent quantity: See White Paper 10A.

Effluent quality: U.S. EPA, *Development Document for Proposed Effluent Limitations Guidelines and Standards for the Pulp, Paper and Paperboard Point Source Category*. Washington: U.S. EPA Office of Water, EPA-821-R-93-019, pp. 6-48 - 49, 10-42.

**Figure N1. Relative Effluent Flows and Effluent Quality for Kenaf vs. Softwood Fiber (Source: Paper Task Force 1996)**

The potentially greater water demand does not constitute a consumptive use of water, but it could be a constraint in situations where water supplies are limited. Higher process water use requirements associated with agrifiber would impose a greater hydraulic load on wastewater management systems whose costs are sensitive to hydraulic load. Increased water use could also mean a greater loss of heat and process water chemicals that contributes to an incrementally larger life cycle footprint.

### Reference

Paper Task Force. 1996. *Non-wood plant fibers as alternative fiber sources for papermaking*. White Paper 13. [http://c.environmentalpaper.org/documents/1634\\_WP13.pdf](http://c.environmentalpaper.org/documents/1634_WP13.pdf)