

SUMMARY

There are 16 sugar cane processing plants and one stand-alone refinery in the Republic of South Africa which produce about 2 million tonnes of sugar per annum according to the 1985 figures. More recent production figures for the sugar industry are not available. Of the 16 processing plants 10 are mills only and 6 are mills with a so-called 'back-end' refinery. The latter situation is increasingly becoming the trend in the sugar industry worldwide.

The sugar industry is unusual in that the main raw material (sugar cane) contains very large quantities of water (about 70% by mass). As the main process in both a mill and a refinery is concerned with extracting sugar crystals from solution, the vast majority of this and any other water entering a plant is evaporated and can be recovered as condensate. Water from other sources (typically boreholes or river abstraction) is used only in applications such as cooling for condensation of vapours or domestic consumption. Specific water intake (SWI) was found to be 30 to 100 m³/100 t of cane processed with a mean SWI of 60 m³/100 t.

Wastewater volumes are relatively small compared to the total volumes of water in circulation at any one time. Typically 750 to 1500 m³/d of waste water (about 30% of the water intake) is generated with a chemical oxygen demand of 1 500 to 2 000 mg/ℓ. The main source of this chemical oxygen demand (COD) is sugar lost in washing and in cooling water overflows. Sugar plant waste waters are problematic in that the COD load present is almost totally soluble leading to sludge bulking and sludge loss problems in conventional biological treatment systems. They also tend to be deficient in nitrogen and phosphorus.

By-products from a sugar processing plant are molasses, which goes to animal feed or further processing to fermentation products, and bagasse which is burnt in the sugar plant boilers or can be further processed to paper and chemical products.

Solid wastes arising from sugar processing are boiler ash and smuts which go to landfill and filter cake (from the milling process) which may be used as fertilizer in some areas or alternatively is also disposed of as landfill.