EFFECTS OF DECREASED WATER USE ON DISCHARGES TO WATER

Effective Liquor Loss Reduction and Spill Control

Consistently meeting effluent quality objectives involves effective management of losses of organic material to sewer and successful use of wastewater treatment systems. While the recovery of pulping chemicals is a central component of virtually all[1] chemical pulping facilities, there are ongoing routine losses of these chemicals, due to the complex nature of the processing systems, which are either recovered back into the process or are sent to wastewater treatment. In contrast to "spills" of spent pulping liquor, "losses" occur on a relatively ongoing basis, given that daily facility operations result in both intentional and unintentional releases of dilute spent liquor into the process sewer system.

These losses, which are different from larger spills, can occur within the pulp processing and pulping chemical recovery systems, from pumps, valves, knotters, screens, washers, and other equipment, as well as through intentional diversions from the evaporators (e.g., during boil-outs), digesters (e.g., during hard or soft cooks), and during start-up and shutdown operations. Losses can also occur unintentionally through human error, tank overfilling, or mechanical failure. These losses do not typically lead to a regulatory exceedance, but can contribute to effluent characteristics such as color and foam. Reducing and recovering losses of spent pulping liquors can result in better performance of wastewater treatment systems, decreased "pass through" of substances that may resist biological degradation, and incremental benefits to the mill's energy generation and chemical cost profiles (NCASI 1982, 2006; Amendola et al. 1996; USEPA 1997).

The bleach plant contributes approximately 2.5 kg COD/ton of pulp for each Kappa point drop in the bleach plant. Planned discharge from the brownstock washers and screening is approximately 1 kg COD/kg saltcake lost. The remaining COD contribution to the effluent treatment plant can be attributed to unplanned discharges and range from 1 kg/ton pulp to 40 kg/ton pulp. Dynamic simulation is a useful tool for liquor loss evaluation and spill collection system design (Lundström et al. 2003).

NCASI Special Report 12-02 provides perspective on designing and implementing best management practices for reducing in-plant spent pulping liquor losses, along with a summary of potential benefits (NCASI 2012). NCASI Technical Bulletin No. 341 describes spill management at four mills (NCASI 1981). Spill management techniques at mills are also reviewed in NCASI Technical Bulletin No. 557 (NCASI 1988).

References

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[1] While all kraft pulping facilities recover their spent pulping liquor, there are constraints facing sulphite pulping mills that do not use magnesium as a pulping base. Very few non-magnesium base sulphite mills are in operation today.

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