

The influence of algal biomass on tracer experiments in maturation ponds

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ABSTRACT

Tracer experiments are of concern to wastewater treatment engineers and researchers because of the importance of determining hydraulic regimes and retention times in wastewater treatment units. In this work, a pilot-scale maturation waste stabilisation pond (WSP) was spiked with Rhodamine WT, in order to determine how suspended organic matter would interfere with its performance as a tracer in a domestic wastewater treatment unit which had a high content of suspended algal biomass. A primary maturation pond was spiked in three separate runs with different levels of algae (high, medium and low), with a known amount of Rhodamine WT (20% v/v); the tracer was measured in the pond effluent in real time every 20 min for 3θ (the theoretical retention time, $\theta = 17$ d). Algal biomass was monitored weekly from influent, column and effluent water samples by chlorophyll-a determination. The results show that algal biomass has a strong influence on the behaviour of Rhodamine WT as a tracer and therefore the hydraulic characteristics calculated from tracer curves may be affected by tracer adsorption on suspended organic matter.

Keywords: Algal biomass; Hydraulic characteristics; Maturation ponds; Tracer experiments

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