Optimal Sequencing Batch Reactor Conditions for Greywater Nitrogen Removal

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Abstract

The Republic of Trinidad and Tobago, arguably the most industrialised country of the English-speaking Caribbean, lags behind other similarly developed countries across the world in its utilisation of wastewater treatment systems. It is common place to see greywater being disposed into municipal storm water drains, even in the capital city and the Caroni River epitomises the effects of long-term wanton disposal of wastewater, greywater included. This study assessed the nitrogen removal capability of a sequencing batch reactor (SBR) on low strength greywater. Contrary to conventional systems, non-anaerobic conditions were maintained and no external carbon was supplied. The greywater collection time was varied to allow for observation of its treatability relative to its composition and different biological solid retention times (SRT) were assessed. A maximum of 83% total nitrogen removal was attained amongst the morning samples using a 5-day SRT. A similar maximum total nitrogen removal was also attained for the afternoon samples but required a higher SRT of 7 days.

Keywords: Aerobic, greywater, sequencing batch reactor (SBR), solid retention time (SRT), total nitrogen (TN)