

Simulation of a wastewater treatment plant receiving industrial effluents[#]

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Abstract

A process model simulating the Mariannridge Wastewater Treatment Plant, located in the eThekwini Municipality, has been developed in the WEST (Worldwide Engine for Simulation, Training and Automation) modelling environment, based on the IWA Activated Sludge Model No. 3 (ASM3). The treatment plant receives a high proportion of industrial effluents. The development of the model involves the characterisation of the influent wastewater and determining model parameters (kinetic and stoichiometric coefficients) by undertaking batch respirometric tests on the wastewater and activated sludge, flocculation filtration and simulation of the batch respirometric experiment. To account for equipment-specific factors, the simulation model was calibrated against plant data covering a year's operation.

The model is intended to be used as part of a system to evaluate the ability of a receiving wastewater treatment works to adequately treat a particular industrial effluent before granting a permit for it to be discharged to sewer.

Keywords: oxygen uptake rate, activated sludge process, calibration