Environmental Engineering and Management Journal November 2016, Vol.15, No. 11, 2357-2365
http://omicron.ch.tuiasi.ro/EEMJ/

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PROCESS RESPONSE OF WASTEWATER TREATMENT PLANT UNDER LARGE RAINFALL INFLUENT FLOW

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Abstract

New processes of wastewater treatment plant (WWTP) to treat large rainfall influent flow of upriver combined drainage system were proposed by taking a WWTP in Tianjin as an example. InfoWorks and Biowin software were applied to simulate the upriver combined drainage system and the performance of proposed processes, respectively. After the model calibration and validation, the influence of rainfall anticipated on influent flow, water quality, and response operation of WWTP were studied. The results showed that the influent flow greatly exceeds the designed treating capacity of WWTP resulting in an adverse impact on operation. On the basis of original process of WWTP, two kinds of process modifications were proposed to treat the large influent flow due to rainfall, i.e. the biologically enhanced primary treatment and biologically enhanced primary treatment combined with secondary treatment. The results showed that the pollutant removal rate of WWTP is significantly improved and the impact of rainfall on WWTP operation is greatly weakened by applying the proposed processes.

Key words: Biowin, InfoWorks CS, process modification, rainfall, wastewater treatment plant

Received: March, 2013; Revised final: June, 2013; Accepted: June, 2013

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