THE EFFICIENCY OF ORGANIC MATTER AND PHOSPHORUS REMOVAL FROM SEWAGE IN CONSTRUCTED WETLANDS

Key words: BOD$_5$, phosphorus, reed bed, wastewater treatment

Summary

Biological part of wetland consists of vegetated gravel bed with horizontal subsurface flow and pond, which are preceded by mechanical treatment in sedimentation tank. In the years 2004-2005 (the sixth and the seventh year of system operation) the sewage samples at different stages of treatment and from the outlet were taken for BOD$_5$ and phosphorus analysis. The treatment efficiency assessment was made both for gravel bed and for the whole system. Also the results of previous analysis available from administrator, covering the period from second to fifth year of system operation, were included in the paper. The results of system's monitoring showed that removal efficiency of biodegradable organics (BOD$_5$) in gravel bed amounted 77.5-85.5% in 2004 and 52.9-90.3% in the first half of 2005. Phosphorus concentration in sewage treated in gravel bed varied: both the decrease and increase of concentration was observed. BOD$_5$ removal efficiency in the whole constructed wetland system amounted 85.7-97.7% in 2004 (outlet BOD$_5$ concentrations varied from 10 to 40 mg O$_2$·dm$^{-3}$) and from 77.4 to 91.4% in the first half of 2005 (outlet BOD$_5$ concentrations varied from 20 to 70 mg O$_2$·dm$^{-3}$). The concentration of phosphorus in treated sewage varied from 0.03 to 0.7 mg·dm$^{-3}$ in 2004 and from 0.1 to 9.8 mg·dm$^{-3}$ in the first half of 2005. Trends of changes in the removal efficiency in both gravel bed and the whole system were assessed based on obtained results.

Address: mgr inż. J. Sekułowicz, Szkoła Głównej Gospodarstwa Wiejskiego, Katedra Kształtowania Środowiska, ul. Nowoursynowska 159, 02-776 Warszawa; tel. +48 (22) 593-53-82, e-mail: joanna_sekulowicz@sggw.pl