Ovidius University Annals of Chemistry Volume 18, Number 1, pp 60-66, 2007

The assessment of biological phosphorus removal possibilities at Constantza South municipal WWTP, Romania

Angela PANA[a] and Elisabeta CHIRILA[b]*

[a] *Department of Natural Sciences, Ovidius University of Constanta, 124 Mamaia Blvd, 900527 Constanta, Romania*
[b] *Department of Chemistry, Ovidius University of Constanta, 124 Mamaia Blvd, 900527 Constanta, Romania*

Abstract Biological nutrient removal (BNR) is based on two microbial metabolisms, microbial development process and intracellular storage as polyphosphate, achieved by phosphorus accumulating organisms. Biological removal process efficiency is high when the treated wastewater supplies a large quantity of biodegradable carbon source. For Constantza South waste water treatment plant (WWTP) case-study, quantitative determinations (pH, temperature, SS, COD, BOD, P_t) have been performed in one year period, in order to analyze the existing situation and to assess the possibility to apply the phosphorus removal process. The samples collecting points have been: plant influent (PI), biological stage influent (BI), biological stage effluent (BO), bioreactor's anaerobe area (AN) and bioreactor's aerobe area (A). The water temperature and pH does not present high variations in a year time. P_t annual average values for PI, BI and BO have been of 3.12, 3.17 and respectively 2.13 mg/L. The values obtained at biological treatment inlet for COD/P are in 14.55 – 152.17 range and for BOD/P 6.43 – 11.95. Annual average value for P_t at plant outlet does not observe the 1mg/L limit and a direct relation between it and COD/P (or BOD/P) value cannot be established. Ensuring a convenient COD/P in the treated water is not a sufficient condition to obtain a phosphorus concentration lower than 1mg/L.

Keywords: municipal waste water treatment, biological phosphorus removal, COD, BOD, COD/P, BOD/P,

ISSN-1223-7221