**Performance Evaluation of the Organic Matter Removal Efficiency in Wastewater Treatment Plants; Al- Diwaniyah WWTP in Iraq**

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**Abstract:**

This study aims to assess the removal efficiency and establish the BOD5 and COD statistical correlation of the sewage flowing in Al-Diwaniyah wastewater treatment plant in Iraq during the study period (2005-2016). The strength of the influent wastewater entering the plant varied from medium to high in strength. High concentrations of BOD5 and COD in the effluent were obtained due to the poor performance of the plant. This was observed from the BOD5 /COD ratios that did not confirm with the typical ratios for the treated sewage. To improve the performance of this plant, regression equations for BOD5 and COD removal percentages were suggested which can be used to facilitate evaluation of liquid waste and optimal control process. The equations relating the percentage removal of BOD5(y) with influent BOD5(x), y= 0.044x + 80.66 and the percentage removal of COD (y) with influent COD (x), y= 0.045x + 55.1 were found with high correlation R2 =0.72 and 0.86 respectively.