THE EFFECTS OF MODIFICATION FOR CONTACT STABILIZATION ACTIVATED SLUDGE ON EBPR

ABSTRACT

Excessive phosphorus can cause eutrophication in water bodies and need to be reduced in most wastewaters before discharge to receiving waters. The excess biological phosphorus removal (EBPR) process has been shown to be an economical and environmentally compatible method of reducing phosphorus from wastewaters. Despite the complexity of EBPR mechanisms, appropriately designed and operated treatment plants can easily achieve phosphorus (P) removal as long as EBPR-available organic substrates such as short chain volatile fatty acids (VFAs) and an aerobic – anaerobic (respectively) reactor configuration is provided. Some factors and operating conditions, adversely affect the performance of EBPR plants. Available design and research information for the EBPR process were directly related to organic strength, solids and phosphorus content in wastewater. The success of enhanced biological phosphorus removal (EBPR) process is largely dependent on the characteristics of organic carbon present in wastewater. The COD &BOD_5 content of wastewater will also determine whether a phosphorus removal EBPR system is required. For this paper, the performance of EBPR was investigated using modified contact stabilization activated sludge pilot plant. The study involved the construction of pilot plant which setup in Quhafa WasteWater Treatment Plant (WWTP), Al Fayoum, Egypt. Results showed average removal efficiencies of COD, BOD_5 and TP are 91%, 92% and 85% respectively.

Keywords: Enhancement Biological Phosphorus Removal (EBPR); contact stabilization; activated sludge; phosphorus Accumulating Organisms (PAO), poly-β-hydroxyalkanoates (PHA) and total phosphorus (TP).