

Membrane bioreactor for the treatment of municipal blackwater in Egypt

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ABSTRACT

Membrane bioreactor (MBR) technology has become a key component in water reclamation schemes for nearly 30 years due to the possibility of providing high quality water. The objective of the present study is to investigate the efficiency of MBR for the treatment of municipal blackwater. A pilot-scale MBR unit was installed and operated in the NRC, Egypt. Blackwater was primary treated through three chambers baffled sedimentation tanks. The effluent was then directed to the MBR. The reduction in the MBR permeates for COD and BOD ranged from 90 to 94% and from 90 to 97%, successively. The corresponding level of COD ranged from 34 to 76 mg/l, and BOD ranged from 6 to 18 mg/l. The average removal rate of ammonia and TKN was 97% and 94%, respectively. The averages values of some parameters in permeate were as follow: TSS, 0.6 mg/l; COD, 42 mg/l; BOD, 10 mg/l; NH₃-N, 5.8 mg/l. This indicates the advantages of membrane filtration over the activated sludge processes. Therefore, MBR process was found to be efficient for improving effluent quality. Such performance will guide the decision maker on the potential of MBR application and advantages of efficient wastewater treatment for irrigation purpose in Egypt.

Keywords: Membrane bioreactor (MBR); Municipal separation; Wastewater; Treatment; Blackwater

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