Tertiary Treatment of Hotel Wastewater by Reverse Osmosis for Water Reuse; A Case Study at Le Grand Hotel, Galle

KD Nilakshi[1], S Wijethunga[1] and APP Senevirathna[2]
[1]Departmentof Agricultural Engineering, Faculty of Agriculture, University of Ruhuna, Kamburupitiya, Sri Lanka
[2]Enviroplus Engineers (Pvt) Ltd, Battaramulla, Sri Lanka

Abstract
Demand for city water supply by industrial sector is rising drastically. Hotels consume a huge amount of water for their operational and recreational practices. Thus, the demand for water in the hotels is difficult to achieve by the city water supply. Hence, the reuse of treated wastewater (WW) after tertiary treatment can reduce the fresh water demand and this treated WW can be used for non-potable water consumption. In this study we attempted to evaluate a reverse osmosis (RO) system for the treatment of secondary treated wastewater (after rotating biological contactor) to reuse in boilers and cooling towers in Le Grand Hotel, Galle. Based on the flow rate and total dissolved solids (TDS) of secondary treated water, the RO plant was designed using Hydranautics Nitto software. Designed RO plant was installed and evaluated the treatment efficiency for three months. Samples were taken after RBC and RO and they were analyzed for COD and TDS. According to the results, COD removal was 100% by the RO while TDS removal was 95%. The statistical analysis showed that the quality of tertiary treated water (COD and TDS) significantly lower than the reference values given by the central environmental authority. Based on the results of this study, it can be concluded that the tertiary treated water through reverse osmosis can easily be used for boilers and cooling towers for steam-making and chilling processes reducing the demand for fresh water.

Keywords: Reverse osmosis, Tertiary Treatment, Total dissolved solids, Wastewater
***Corresponding author**: dilminilakshi1993@gmail.com