Design of RO Process for the Purification of River Water in the Southern Belt of Bangladesh

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Abstract

The salinity of on-site river water of the industry is high as 13000 ppm due to intrusion of salt from the sea in the southern belt of Bangladesh. This leads to increasing level of corrosion of equipment and a number of industries are facing increasing production cost because of that. On the other hand, Department of Environment (DOE) of Bangladesh are reducing/stopping the use of underground water and pursuing major municipalities and industrial units to increase the use of surface water such as river water. Bringing water from an up-stream point of the river by constructing a pipeline is not an economically viable option. The technical water such as demineralised water can be supplied to process and power industries for general cooling and boiling equipment by treating the river water using the Reverse Osmosis (RO) process. For this purpose, in this work, design of RO process for the purification of highly saline river water of the southern belt of Bangladesh is considered using model based techniques. RO process model is developed within ASPEN custom modeller. Water specific data are taken from Rupsha river and Karnafuli river. The simulation results of the model are compared with those of available in the literature. Finally, a systematic approach of model based demineralisation RO process development is presented.