

# ROCK-BED FILTRATION PERFORMANCE EVALUATION FOR WASTEWATER TREATMENT

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## **Abstract**

Pilot-scale experiments were conducted at a site near the biological pond of Suranaree University of Technology (SUT) to evaluate the performance of a rock-bed filtration process under different operating conditions. Experimental setup consisted of two rectangular reactor units, head tank unit, filter media, and aeration system. The reactors were fed with SUT wastewater from the biological pond by a pump through the head tank unit. During the  $5\frac{1}{2}$  months operation, the HRT, filter media size, and aeration system were changed in 3 runs consisting of eight experiments to analyze the filtration mechanism. The results showed that the maximum removal efficiency was found for particulate matter, ranging 60-90%. In case of T-BOD, removal was not significant in the beginning but reached up to 81-82% during the third run. The effluent quality improved with an increase in HRT up to 9 h and showed only minor improvement thereafter. Smaller rock size media showed best results for particulates removal. The run with 6 air diffusers and 9 h HRT had significantly improved T-BOD removal (up to 76%). The porosity of rock-beds was reduced by approximately 11% over  $5\frac{1}{2}$  months operation.

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