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An economically viable treatment method to improve effluent quality of small scale vehicle service stations

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Vehicle service stations are considerable wastewater generators which are now increasing rapidly in number all around the world. In Sri Lanka, the treatment plants operating in these service stations are functioning poorly. Especially the small scale service stations in rural areas release wastewater with inadequate treatment. The present study was carried out to introduce a low cost and effective simple treatment method for effluents of small scale service stations. In the study, characterized homogenized effluent samples collected from small scale service stations were passed through a Slow Sand Filter which is constructed by using sand, gravel and partially burnt rice husk. The Chemical Oxygen Demand (COD), oil & grease and lead (Pb) concentrations in the filtered samples were determined. Filters were operated at three different flow rates in replicates. The selected flow rates for the study were 60 ml/min, 30 ml/min, and 15 ml/min. Percentage removal of oil & grease, Pb and percentage reduction of COD were calculated at each flow rate. The reduction in the percentage of the above parameters was higher at the flow rate of 15 ml/min compared to the other flow rates. Reduction percentages of COD, oil & grease and Pb were 56.4 %, 59.1% and 64.7% respectively. The results also indicate that flow rate is a key parameter which influences the percentage removal of oil & grease and Pb in wastewater. Further studies are required to optimize the flow rate for maximum removal of oil & grease and Pb from service station effluent.

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