

## Performance Evaluation of Filtration System for Groundwater Recharging Well in the Presence of Medium Sand-Mixed Storm Water

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**Abstract :** The collection of storm water runoff and forcing it into the groundwater is the need of the hour to sustain the ground water table. However, the runoff entraps various types of sediments and other floating objects whose removal are essential to avoid pollution of ground water and blocking of pores of aquifer. However, it requires regular cleaning and maintenance due to the problem of clogging. To evaluate the performance of filter system consisting of coarse sand (CS), gravel (G) and pebble (P) layers, a laboratory experiment was conducted in a rectangular column. The effect of variable thickness of CS, G and P layers of the filtration unit of the recharge shaft on the recharge rate and the sediment concentration of effluent water were evaluated. Medium sand (MS) of three particle sizes, viz. 0.150-0.300 mm (T1), 0.300-0.425 mm (T2) and 0.425-0.600 mm of thickness 25 cm, 30 cm, and 35 cm respectively in the top layer of the filter system and having seven influent sediment concentrations of 250-3,000 mg/l were used for the experimental study. The performance was evaluated in terms of recharge rates and clogging time. The results indicated that 100 % suspended solids were entrapped in the upper 10 cm layer of MS, the recharge rates declined sharply for influent concentrations of more than 1,000 mg/l. All treatments with a higher thickness of MS media indicated recharge rate slightly more than that of all treatment with a lower thickness of MS media respectively. The performance of storm water infiltration systems was highly dependent on the formation of a clogging layer at the filter. An empirical relationship has been derived between recharge rates, inflow sediment load, size of MS and thickness of MS with using MLR.

**Keywords :** groundwater, medium sand-mixed storm water filter, inflow sediment load

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