

## The reduction of nutrients by riparian silty soil and sandy soil: Comparison and analysis

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Received 30 November 2010; Accepted in revised form 3 April 2011

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### ABSTRACT

RBS (or VFS) is a facility that reduces non-point source pollutants with a sustainable reduction effect and an excellent visual impact. Now that RBS is located in streamsides, and it is distributed by various sandy soils and sands, which have been deposited over long periods of time owing to the hydraulic dynamics of rivers. In this study, we manufactured three types of bench-scaled units to compare and analyze the effect of the reduction of nutrients in silts and sands. Then, we investigated the reduction of T-N,  $\text{NH}_4^+$ ,  $\text{NO}_3^-$ ,  $\text{NO}_2^-$ , T-P, and  $\text{PO}_4^-$  using silt (SILT), sand (SAND), and mixed silt and sand (SILT + SAND) units. The influent water was comprised of reagent and distilled water and quantitative data was acquired with stable indoor experimental conditions. As a result, silts were 2 times better than sands in reducing nutrients. Silts had better effects in reducing nitrogen and showed a 79% reduction rate for  $\text{NH}_4^+$  through the adsorption in soils due to ion effects. However, the reduction rate of T-N was not as high as that of  $\text{NH}_4^+$  was. The reduction rate of the phosphorus was 99% in SILT and it did not change over time. However, this was not good in sands, and the reduction rate had actually decreased over time. This study verified that soils with fine particles had a better reduction rate for nutrients and only soils significantly had reduced the nutrients. However, because fine soils impoverished permeability, additional studies were required in order to build the actual RBS.

*Keywords:* RBS (or VFS); Bench scale; Unit; Silt; Sand; Soil; Permeability

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