

Jaruwan Junsod 2006: Solid Waste Landfill Leachate Treatment by Subsurface Flow Constructed Wetland. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Assistant Professor Wilai Chiemchaisri, D.Tech.Sc. 133 pages.  
ISBN 974-16-2305-4

This study was performed to compare the removal efficiencies of organic matters and total nitrogen in landfill leachate treated by horizontal(HSF) and vertical(VSF) subsurface flow constructed wetland. Cattails (*Typha angustifolia*) were used as macrophytes. The influent parameters of fresh and old leachate were controlled: TCOD 5,848-12,816 mg/L, TN 144-366 mg/L and TCOD 474-5,069 mg/L, TN 107-1,454 mg/L, respectively. Each system had varied hydraulic loading rates (HLR) of 1, 2.8 and 5.6 cm/d. It was found that treatment of organic matters in terms of BOD and COD in fresh leachate giving higher removal efficiencies than that in old leachate at every HLR in both systems. Furthermore, the optimum HLR of the HSF system for treatment both fresh and old leachate were 2.8 and 1 cm/d which the removal efficiencies were 97-99% and 58-71% , respectively. For total nitrogen removal, it shows that treatment of fresh leachate (43% removal) and old leachate (46% removal) were not much different, and at HLR 1 cm/d gave the highest nitrogen removal efficiency in both leachate.

For the VSF system, the HLR of 1 cm/d was the optimum operating condition for treatment of total nitrogen in fresh leachate (55% removal) which gave better efficiency than the HSF system's. However, in case of old leachate, (27% removal) the VSF system gave lower efficiency than that in the HSF system. In conclusion, the HSF had higher efficiencies than the VSF system in treatment of fresh leachate (TCOD removal > 90%; TN removal 43%) which the optimum HLR was 1 cm/d. This system can be applied for treatment landfill leachate having the characteristics closely to the leachate used in this experiment (TCOD < 12,000 mg/L).

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29 / May / 06