Narinthon Moungsan 2015:Utilization of Lignite Fly Ash in Constructed Wetland Treatment System for Reducing Phosphate from Domestic Wastewater.Master of Science (Environmental Science), Major Field: Environmental Science, Department of Environmental Science. Thesis Advisor: Associate Professor KanitaTungkananuruk, M.Sc.91 pages.

This research was to enchance the phosphate removal efficiency of the constructed wetland treatment system by using lignite fly ash from pulp and paper industry. The phosphate removal efficiency at 96.64 was achieved from lignite fly ash 4 g per 50 mL of 10.0 ppm. the standard phosphate solution and 20 min of contact time. Experimental adsorption data fitted with Langmuir and Freundlich adsorption isotherms. The column experiment was also investigated to determine the phosphate removal by filtration layers (gravel, coarse sand and fine sand) which the top layer was the mixture of lignite fly ash and soil in the ratio by weight of 1:10. The results revealed that continuous flow treatment gave the maximum removal efficiency at 99%. Therefore, the constructed wetland was simulated in square plastic tank size 51x51x54 cm. that packed with gravel 7cm, coarse sand 3 cm, fine sand 2 cm. and mixed lignite fly ash with soil (1:10) 30 cm. and growing emergent plants (*Vetiveriazizanioides* and *Typhaangustifolia*Linn). The results demonstrated that the phosphate removal efficiency of two treatment plants in excess of 90% from 80 L. of wastewater from Kasetsart University collection wastewater pond were obtained while the control unit which using only soil in the top layer, about 68% was obtained. The experimental results shows that lignite fly ash has a good potential to remove phosphate which is the cause of eutrophication.

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