

**POLLUTION CONTROL OF LEACHATE
USING PHYTOREMEDIATION IN JETIS LANDFILL,
PAKEM VILLAGE, GEBANG SUB DISTRICT,
PURWOREJO REGENCY, CENTRAL JAVA PROVINCE**

By :

Deborah Elisabeth Thiesya
114140072/TL

ABSTRACT

The colour of leachate in IPL of Jetis landfill is greenish black and it potentially pollutes the wells of residents around the Jetis landfill. This study was aimed to find out the quality of monitoring wells and community wells based on the Pollution Index method; to determine the quality of leachate from the inlet and outlet in IPL of Jetis landfill; to analyze the effectiveness of phytoremediation method with lotus plants (*Nymphaea sp.*) in reducing the BOD, COD, and TSS content in the inlet IPL of Jetis landfill; and to give recommendation the appropriate IPL design for the Jetis landfill.

Sample of resident wells was taken with purposive sampling and then it was tested in the laboratory. Pollution Index was obtained from Pollution Index calculation with 8 parameters were pH, temperature, BOD, COD, TSS, cadmium, TDS, and fecal coliform bacteria in 5 samples. The results were analyzed and the quality of groundwater was mapped. The quality of leachate from the inlet and outlet in IPL of Jetis landfill was obtained by grab sampling method, afterwards it was tested in the laboratory. Parameters for leachate quality test were pH, temperature, BOD, COD, TSS, cadmium, TDS, total N, fecal coliform bacteria, and mercury. The results were analyzed and presented in table and graph. The effectiveness of phytoremediation method obtained by the test of leachate with addition of lotus plants (*Nymphaea sp.*), gravel, palm fiber during 3-day residence time and 7-day residence time then the BOD, COD, and TSS parameters were analyzed. The calculation results of effectiveness were analyzed descriptively. The appropriate design for IPL of Jetis landfill is using SFS horizontal flow type in constructed wetland.

The results obtained were the quality of leachate for BOD, COD, TSS, and TDS parameters in the inlet still exceeded the standard quality and all parameters at the outlet had met the standard quality. The water quality status at 5 wells was classified as mild pollutant with the smallest PI_j value is 1.062 and the largest PI_j value is 2.878. The effectiveness of phytoremediation experiment in batch system with a 3-day residence time was BOD (-76.73%), COD (-33.839%), and TSS (-48.387%), while the 7-day residence time was BOD (-130.017%), COD (-64,343%), and TSS (-129,032%). The phytoremediation treatment in batch system was not effective in reducing the levels of BOD, COD, and TSS, so SFS horizontal flow type in constructed wetland was used to manage the IPL of Jetis landfill.

Keywords : Landfill, leachate, phytoremediation, lotus plants, IP, constructed wetland