

**GROUNDWATER TREATMENT TECHNIQUES AT PUTRI CEMPO
LANDFILL AREA, MOJOSONGO VILLAGE,
JEBRES SUBDISTRICT, SURAKARTA CITY
WITH ZEOLITE ADSORPTION METHOD**

By
Desi Ika Ariyanti
114130002

Abstract

Putri Cempo Landfill performs has an Open Dumping Method in its waste processing and does not have leachate treatment. Leachate from Putri Cempo Landfill causes declining in environmental quality, above and below surface like groundwater. Groundwater is a source of raw water used by the people in Mojosoongo and Plesungan villages, so it is necessary to maintain the function of groundwater, especially the quality of groundwater as clean water. This study aims to determine the quality of groundwater in the study area, to determine the effectiveness of zeolite as an adsorbent to treat groundwater, and to determine the appropriate groundwater treatment in the study area.

The research methods are survey and mapping, mathematical, interview, Grid Sampling and Purposive Sampling, laboratory analysis, and pollution index (IP) method. The numbers of groundwater samples are taken from 7 spots based on the direction of groundwater flow. Water quality test is conducted in laboratory with physical parameters such as temperature, odor, taste, turbidity, TSS & TDS, pH, DO, BOD, COD, Fe, Pb, Cl and Total coliform as biological parameters. The quality standard use Government Regulation of Republic of Indonesia No. 82 in 2001 and Minister of Health Regulation of Republic of Indonesia No. 492/MENKES/PER/IV/2010. Groundwater treatment uses Zeolite Adsorption Method by comparing variable of residence time.

The results show that groundwater at the research area is having light contamination and not suitable for drinking water. Lead Parameters (Pb) that exceed the quality standard is appropriate with the characteristics of leachate from the landfill. Decreasing groundwater quality in the study area is affected by the distance to Putri Cempo Landfill as a source of pollutants and following the water flow direction. The effectiveness of zeolite as adsorbent for Lead parameter (Pb) is 90.79% and 90.633% with 60 and 30 minute time, while TDS parameters are equal to 71.7% and 71.11% with 60 and 30 minutes retention time. Groundwater treatment technique by using Zeolite Adsorption Method is able to decrease Lead (Pb) concentration from groundwater so that it can be used as raw water requirement for the community in research location.

Keywords: Groundwater quality, mild contamination, Zeolite Adsorption.