

**PERANCANGAN INSTALASI PENGOLAHAN AIR LINDI TEMPAT PEMROSESAN AKHIR (TPA)
SAMPAH CIPAYUNG, KELURAHAN CIPAYUNG, KECAMATAN CIPAYUNG, KOTA DEPOK,
JAWA BARAT**

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INTISARI

TPA Sampah Cipayung menghasilkan air lindi yang ditampung di IPAL TPA yang dapat menyebabkan menurunnya kualitas lingkungan seperti mencemari airtanah dan air permukaan yang ada di sekitar TPA yang diakibatkan oleh pengolahan air lindi pada IPAL TPA yang tidak benar. Penelitian ini bertujuan untuk mengetahui karakteristik air lindi, status mutu airtanah dan air permukaan, dan penerapan metode *Constructed Wetland* untuk mengolah air lindi dalam upaya perancangan instalasi pengolahan air lindi di TPA Sampah Cipayung.

Metode yang digunakan dalam penelitian ini antara lain metode survei dan pemetaan lapangan, metode matematis, metode laboratorium meliputi uji kualitas air lindi, airtanah, dan air permukaan, serta uji percobaan constructed wetland, dan metode evaluasi dengan metode indeks pencemaran.. Jumlah sampel air sebanyak 5 titik berdasarkan arah aliran airtanah dan aliran sungai sebelum dan sesudah melewati area TPA. Pengujian kualitas airtanah dilakukan di laboratorium, disesuaikan dengan Peraturan Menteri Kesehatan Republik Indonesia No. 492 Tahun 2010 tentang Persyaratan Kualitas Air Minum, kualitas air permukaan berdasarkan baku mutu air kelas II Peraturan Pemerintah Republik Indonesia No. 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air, pengujian kualitas air lindi berdasarkan baku mutu Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia No P.59/Menlhk/setjen/kum.1.7/2016 tentang Baku Mutu Lindi Bagi Usaha dan/atau Kegiatan TPA Sampah

*Hasil pengujian airtanah termasuk kelas tercemar sedang. Hasil uji air sungai AP 1 termasuk kelas tercemar ringan, lokasi AP 2 termasuk kelas memenuhi baku mutu, AP 3 termasuk kelas tercemar sedang, AP 4 termasuk kelas tercemar ringan. Efisiensi perancangan constructed wetland skala laboratorium dengan waktu tinggal 2 hari, efektivitas tertinggi pada parameter N Total 85,29%, terendah pada parameter pH 9,30%. Pengolahan waktu tinggal 4 hari, efektivitas tertinggi pada parameter N Total 98,28%, terendah pada parameter pH 9,30%. Waktu tinggal 4 hari terbukti lebih efektif dibanding waktu tinggal 2 hari. Desain dan teknis pengelolaan yang sesuai untuk IPAL TPA Cipayung dalam meminimalisir permasalahan kualitas lingkungan TPA Cipayung, khususnya pencemaran airtanah dan air sungai di sekitar TPA Cipayung dengan membuat bak pengolahan baru menggunakan sistem lahan basah buatan (*Constructed Wetland*), berdimensi panjang 8 m x lebar 4 m x kedalaman 3 m, ketinggian tanaman *Cyperus papyrus* dari permukaan tanah adalah 1,5 m, ketebalan media ijuk 0,75 m, kerikil, 0,75 m, tanah 0,75m dapat menampung debit air lindi sebanyak 10,893 m³/hari.*

Kata kunci : TPA, Karakteristik Air lindi, Status Mutu Airtanah, Air Permukaan, Indeks Pencemar, Metode Constructed Werland

**LEACHATE WATER TREATMENT INSTALLATION DESIGN, RUBBISH FINAL
PROCESSING PLACE CIPAYUNG, CIPAYUNG VILLAGE, CIPAYUNG
SUBDISTRICT, DEPOK CITY, WEST JAVA PROVINCE**

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ABSTRACT

Cipayung Waste TPA produces leachate which is accommodated in TPA WWTP which can cause a decrease in environmental quality such as contaminating groundwater and surface water around the landfill caused by improper processing. This study aims to determine the characteristics of leachate, the status of groundwater and surface water quality, and the application of the Constructed Wetland method to treat leachate in an effort to design a leachate treatment plant in the rubbish final processing place Cipayung.

The methods used in this study include survey and field mapping methods, mathematical methods, laboratory methods including leachate, groundwater and surface water quality tests, as well as constructed wetland trial tests, and evaluation methods with pollution index methods. 5 points based on the direction of groundwater flow and river flow before and after passing through the landfill area. Groundwater quality testing is carried out in the laboratory, according to the Regulation of the Minister of Health of the Republic of Indonesia No. 492 of 2010 concerning Drinking Water Quality Requirements, surface water quality based on class II water quality standards Republic of Indonesia Government Regulation No. 82 of 2001 concerning Management of Water Quality and Water Pollution Control, leachate quality testing based on the quality standards of the Minister of Environment and Forestry of the Republic of Indonesia No P.59 / Menlhk / setjen / kum.1.7 / 2016 concerning Standard of Leachate Quality for Businesses and / or TPA Waste Activity

*The results of groundwater testing are included in the medium polluted class. The results of the AP 1 river water test were included in the light polluted class, the AP 2 location included in the class met the quality standard, AP 3 was included in the medium polluted class, AP 4 was included in the light polluted class. Efficient design of a laboratory-scale wetland with a 2-day residence with the highest effectiveness in the N parameter Total 85.29%, the lowest in the pH parameter 9.30%. Processing of a 4-day stay got the highest effectiveness in the N parameter Total 98.28%, the lowest on the pH parameter 9.30%. Processing a 4-day stay proves to be more effective than a 2-day stay. Design and management techniques that are appropriate for Cipayung Landfill WWTP to minimize environmental quality problems in Cipayung Landfill, specifically groundwater and river water pollution around the Cipayung landfill by creating a new processing tub using a Constructed Wetland system, with a dimension of 8 m x width 4 m x a depth of 3 m, the height of the *Cyperus papyrus* plant from the ground surface is 1.5 m, the thickness of the palm fiber media is 0.75 m, gravel, 0.75 m, 0.75 m soil can accommodate leachate water discharge as much as 10,893 m³ / day.*

Keywords: Landfill, Leachate Characteristics, Groundwater Quality Status, Surface Water, Pollution Index, Wetland Constructed Method