PERENCANAAN INSTALASI PENGOLAHAN AIR LINDI TEMPAT PEMROSESAN AKHIR (TPA) KOPI LUHUR, DUSUN SUMUR WUNI, KELURAHAN ARGASUNYA, KECAMATAN HARJAMUKTI, KOTA CIREBON, PROVINSI JAWA BARAT

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INTISARI

TPA Kopi Luhur menurut adendum AMDAL memiliki IPAL yang berupa kolam-kolam untuk menampung dan mengolah air lindi, namun pada kolamnya masih belum memiliki pengolahan lebih lanjut seperti aerator dan lainnya, sehingga pengolahan pada kolam lindi tidak berfungsi dengan baik, air lindi juga banyak yang menggenang hingga ke jalan dan mencemari air tanah warga. Tujuan dari penelitian ini untuk mengetahui kesesuaian air lindi pada *outlet* IPAL TPA Kopi Luhur dengan baku mutu air lindi, mengetahui kesesuaian airtanah dengan baku mutu air kelas I untuk konsumsi, mengetahui efektifitas percobaan unit IPAL *Constructed Wetland* skala laboratorium, dan memberikan desain IPAL yang direkomendasikan untuk TPA Kopi Luhur.

Metode yang digunakan yaitu metode survei dan pemetaan lapangan, metode *purposive sampling* untuk pengambilan sampel air tanah, air lindi, dan tanah, metode analisis matematis untuk menghitung debit lindi, indeks pencemaran, dan dimensi pengolahan, metode analisis laboratorium untuk menguji sampel air tanah, air lindi, tekstur tanah, dan permeabilitas tanah, metode analisis deskriptif untuk menghitung status mutu air dan efisiensi pengurangan polutan lindi. Percobaan dilakukan dengan metode *Constructed Wetland* skala laboratorium menggunakan tumbuhan *Cyperus papyrus* untuk mengolah efluen lindi, dengan variabel waktu tinggal 2 dan 4 hari.

Hasil pengujian sampel *outlet,* air lindi melebihi standar baku mutu terhadap parameter COD dan TSS yakni 2021 mg/L dan 110 mg/L. Berdasarkan hasil pengujian sampel dan perhitungan status mutu air, air tanah pada daerah sekitar TPA Kopi Luhur memiliki kadar BOD dan COD yang melebihi baku mutu yakni pada AT1 BOD 82 mg/L dan COD 857 mg/L, pada AT2 BOD 72 mg/L dan COD 985 mg/L, sehingga tergolong kedalam tercemar sedang. Berdasarkan hasil percobaan, penurunan konsentrasi polutan pada waktu detensi 4 hari merupakan hasil yang paling efektif, dengan presentase penurunan konsentrasi BOD 67,5159%, COD 67,4832%, N-Total 28,5667%, dan TSS 44,7619%. Desain kolam IPAL yang diberikan merupakan proses perombakan dan penggantian fungsi kolam eksisting, dengan dimensi IPAL rekomendasi yaitu kolam anaerob 14m x 7m x 3m, kolam fakultatif 32 m x 16 m, kedalaman 1,5 m, kolam maturasi 30 m x 15 m, kedalaman 1,5 m, dan kolam *constructed wetland* dengan 29 m x 15 m x 0,8 m, kebutuhan tanaman 392.

Kata Kunci: **IPAL, Tempat Pemrosesan Akhir, *Cyperus papyrus, Constructed Wetland***

LEACHATE WATER TREATMENT PLANT PLANNING ON KOPI LUHUR LANDFILL, DUSUN SUMUR WUNI, KELURAHAN ARGASUNYA, HARJAMUKTI SUB-DISTRICT, CIREBON CITY, WEST JAVA PROVINCE

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ABSTRACT

Kopi Luhur landfill based on Addendum to Environmental Impact Assessment (EIA) has facilities to manage waste, and one of them is LWTP, in the form of ponds to store and treat leachate water, but the ponds still not equipped with aerator or other treatment quipment, so the water treatment on the ponds not works fine, the leachate also stagnate on the road and polluting residents groundwater. The purpose of this study were to determine the compability of leachate at the outlet of the Kopi Luhur landfill's LWTP with leachate quality standards, to determine groundwater suitability with class I water quality standards for consumption, to determine the effectiveness of laboratory scale LWTP Constructed Wetland units, and to provide recommended LWTP design for Kopi Luhur landfill.

The methods used were survey and field mapping method, purposive sampling method for groundwater, leachete, and soil, mathematical analysis method to calculate leachate discharge, pollution index, and to design processing dimensions, laboratory analysis methods used for testing groundwater samples, testing leachate samples, testing soil texture, and soil permeability, analytical descriptive methods were used to calculate the status of water quality and efficiency to reduce leachate pollutants. The experimental design were using a laboratory scale of constructed wetland to treat leachate effluent using Cyperus papyrus and variable residence time of 2 and 4 days.

The research result showed that outlet samples of leachate exceeding the quality standard for COD and TSS parameters, namely 2021 mg/L and 110 mg/L and groundwater in the area around Kopi Luhur landfill had BOD and COD levels that exceed the quality standard, on AT1 BOD 82 mg/L and COD 857 mg / L, on AT2 BOD 72 mg/L and COD 985 mg/L, so that it belongs to the medium polluted. The research result showed that the decrease in pollutant concentration in constructed wetland with a detention time of 4 days was the most effective, with a percentage decrease of BOD concentration 67.5159%, COD 67.4832%, N-Total 28.5667%, and TSS 44.7619 %. The recommendation of LWTP pond design will change the form and the function of existing pond design, to the recommended LWTP dimensions, were anaerobic pond 14 m x 7 m x 3 m, facultative pond 32 m x 16 m, with a depth of 1.5 m, maturation pond surface 30 m x 15 m, with a depth of 1.5 m, and constructed wetland ponds 29 m x 15 m x 0.8 m with Cyperus papyrus needed in it were 392.

Keywords: **LWTP, Landfill, *Cyperus papyrus*, Constructed Wetlan**