# Daur ulang efluen pengolahan air limbah di kawasan industri (studi kasus: PT. Jababeka Infrastruktur) = Recycling effluent of wastewater treatment in industrial area (case study: PT. Jababeka Infrastruktur)

Gita Lestari Putri, author



---

Abstrak

ABSTRAK<br>
Kualitas air Waduk Jatiluhur sebagai air baku Kawasan Industri Jababeka semakin menurun sehingga mengakibatkan beban pengolahan Water Treatment Plant (WTP) Jababeka semakin berat dan biaya pengolahan menjadi semakin tinggi. Penelitian ini bertujuan untuk mengetahui peluang penerapan daur ulang air berdasarkan perbandingan kualitas air baku dan air efluen pengolahan air limbah serta menentukan teknologi daur ulang air yang paling sesuai untuk diterapkan. Perbandingan kualitas air berupa pH, BOD, COD, TSS, dan fecal coliform dilakukan menggunakan grafik box & whisker plot dan uji statistik t-test. Perbandingan pada parameter BOD dan fecal coliform menunjukkan hasil yang tidak berbeda signifikan, sedangkan perbandingan pada parameter pH, COD dan TSS menunjukkan hasil yang berbeda signifikan. Namun, nilai TSS pada efluen Wastewater Treatment Plant (WWTP) jauh lebih baik dibanding dengan influen WTP. Oleh karena itu, daur ulang air limbah berpeluang lebih besar untuk diterapkan. Tiga teknologi daur ulang air terpilih, yaitu reverse osmosis, ultrafiltrasi, dan activated carbon + klorinasi dibandingkan dengan beberapa parameter perbandingan, yaitu kebutuhan energi, biaya konstruksi, biaya operasional dan perawatan, kebutuhan lahan, dan efisiensi penyisihan dengan bobot sebesar 28%, 25%, 23%, 13%, dan 11% berturut-turut. Perbandingan teknologi daur ulang air dilakukan menggunakan metode ranking. Berdasarkan metode tersebut, teknologi reverse osmosis, ultrafiltrasi, dan activated carbon+klorinasi masing-masing mendapatkan skor 1,51; 2,13; dan 2,23 berturut-turut sehingga teknologi activated carbon + klorinasi menjadi teknologi yang paling sesuai untuk diterapkan.
<hr>
ABSTRACT<br>
Water quality of Jatiluhur Reservoir as raw water for Jababeka Industrial Estate is decreasing and resulting the processing load of Water Treatment Plant (WTP) Jababeka to be heavier and higher in processing costs. This study is aimed to assess the opportunities of applying water recycling based on comparison between raw water and effluent of wastewater and to determine the most appropriate technology to be applied. Comparisons of water quality, such as pH, BOD, COD, TSS and fecal coliform was performed using box and whisker plot graphs and statistical t-test. Comparison of BOD and fecal coliform showed results that did not differ significantly, whereas the comparison of pH, COD and TSS showed significantly different results. However, the value of TSS in effluent of Wastewater Treatment Plant (WWTP) is much better than influent of WTP. Therefore, wastewater recycling has greater opportunity to be applied. Three water recycling technology were chosen, namely reverse osmosis, ultrafiltration, and activated carbon + chlorination compared by some parameters of comparison, which are energy requirement, construction cost, operating and maintenance cost, land requirement, and removal efficiency with weights of 28%, 25%, 23%, 13% and 11% respectively. Comparison of water recycling technology was done using ranking method. Under this method, reverse osmosis, ultrafiltration, and activated carbon + chlorination get score 1,51; 2,13; and 2,23

respectively so that activated carbon + chlorination technology is the most appropriate technology to be applied.