

**PENYISIHAN COD, BOD, TSS, AMMONIA
MENGUNAKAN PROSES BIOFILTER TERCELUP
DENGAN MEDIA BIOBALL SECARA AEROB
(Studi Kasus Air Limbah Domestik Waduk Setiabudi Jakarta Selatan)**

ABSTRACT

Denseness of settlement and bad condition of environment sanitation, and also the outcast of wastewater that is removed to water organ directly without manufacture process have been caused river pollution in Jakarta. The main source of pollution in the Jakarta is domestic's waste water (± 80%), where as an industrial waste water giving contribution just 20%. Something to do to manufacturing the domestic wastewater is with Submerged Biofilter. This research used to manufacturing the domestic wastewater so that can be safe for the environment; know about the influence of hydraulic retention time's variation and recirculation rasio for the efficiency of domestic wastewater manufacture using submerged biofilter with bioball's media in aerob by the parameters of BOD, COD, Ammonia, and Total Suspended Solid (TSS). Sample that it use is domestic waste water from one of inlet in Setiabudi's reservoir at South of Jakarta. From the result of a research, can be find the shortest hydraulic retention time is 6 hours with the COD's efficiency value are 78,42%, BOD value are 79,41%, ammonia value are 61,41%, TSS value are 82,06%. Besides that, the most effective of resirculation rasio is 0,5Q. With resirculation rasio 0,5Q, the waste efficiency of COD are 82,42%, BOD are 83,11%, TSS are 83,38% and ammonia are 78,45%. Effluent result of domestic wastewater manufacture using submerged biofilter with biobal's medial in aerob have been safely if removed to water organ because it is suitable enough with the standard of domestic waste water based on the DKI Jakarta's governor regulation number 122 in years of 2005 about Domestic Wastewater execution in the Provinsi DKI Jakarta.

Keywords : domestic wastewater, hydraulic retention time, COD, TSS, BOD, ammonia, biofilter, bioball, aerob

ABSTRAK

Padatnya pemukiman dan kondisi sanitasi lingkungan yang buruk serta buangan air limbah yang langsung dibuang ke badan air tanpa proses pengolahan telah menyebabkan pencemaran sungai-sungai yang ada di Jakarta. Sumber pencemar utama kota Jakarta adalah air limbah domestik ($\pm 80\%$), sedangkan air limbah industri hanya memberikan kontribusi sebesar $\pm 20\%$. Salah satu cara untuk mengolah air limbah domestik adalah dengan proses biofilter tercelup (Submerged biofilter). Penelitian ini dilakukan untuk mengolah air limbah domestik sehingga aman terhadap lingkungan; mengetahui pengaruh variasi waktu tinggal dan rasio resirkulasi terhadap efisiensi pengolahan air limbah domestik menggunakan biofilter tercelup dengan media bioball secara aerob melalui parameter BOD, COD, Ammonia, dan Total Suspended Solid (TSS). Sampel yang digunakan adalah air limbah domestik yang berasal dari salah satu inlet waduk Setiabudi Jakarta Selatan. Dari hasil penelitian didapatkan waktu tinggal terpendek adalah 6 jam dengan nilai efisiensi COD sebesar 78,42%, BOD sebesar 79,41%, ammonia sebesar 61,41%, TSS sebesar 82,06%. Selain itu rasio resirkulasi yang paling efektif adalah 0,5Q. Dengan rasio resirkulasi 0,5Q, efisiensi penghilangan COD sebesar 82,42%, BOD sebesar 83,11%, TSS sebesar 83,38% dan ammonia sebesar 78,45%. Efluen hasil pengolahan air limbah domestik dengan menggunakan reaktor biofilter tercelup dengan media bioball secara aerob sudah aman bila dibuang ke badan air karena sudah sesuai dengan baku mutu untuk air limbah domestik berdasarkan PerGub DKI Jakarta No. 122 Tahun 2005 tentang Pengelolaan Air Limbah Domestik di Provinsi DKI Jakarta.

Kata kunci : Air limbah domestik, waktu tinggal, COD, TSS, BOD, ammonia, biofilter, bioball, aerob