

INTISARI

Penelitian ini bertujuan untuk mengetahui besarnya efisiensi pengolahan IPAL, penurunan kandungan logam berat Fe dan Pb dalam tubuh ikan Nila, dan mengetahui distribusi kandungan logam berat Fe dan Pb pada organ tubuh ikan (kulit, daging, tulang, dan isi perut) di IPAL Sewon Bantul.

Jenis penelitian merupakan penelitian survey dengan pendekatan *Cross-Sectional* yang hasilnya dianalisis secara deskriptif menggunakan *metode induktif* yaitu menganalisa pelaksanaan pengolahan air limbah domestik dibandingkan dengan baku mutu, menghitung efisiensi penurunan dari setiap parameter pemeriksaan air limbah, menganalisis kelayakan konsumsi ikan, serta membuat kesimpulan dan saran.

Hasil penelitian menunjukkan bahwa pengolahan air limbah domestik di IPAL Sewon Bantul Yogyakarta mampu memperbaiki dan menurunkan kadar BOD, COD, TSS, dan Nitrit sesuai baku mutu yang telah ditetapkan SK Gubernur DIY No. 214/KPTS/1991. Uji dengan *T-test* terikat (*Paired Sample Test*) antara BOD, COD, TSS, Nitrit di inlet dengan di outlet, probabilitas 0,05 diketahui nilai signifikasinya BOD (0,001), COD (0,030), TSS (0,000), Nitrit (0,045), sehingga ada perbedaan yang bermakna secara statistik sebelum dan sesudah pengolahan, sehingga proses pengolahan di IPAL Sewon, efisien untuk menurunkan kadar BOD, COD, TSS, dan Nitrit. Kadungan logam berat Fe dan Pb tubuh ikan Nila di kolam IPAL Sewon mengalami penurunan. Rata-rata di kolam aerasi fakultatif 1, logam berat Fe : 379,805 $\mu\text{g/g}$, dan Pb : 58,001 $\mu\text{g/g}$, di kolam aerasi fakultatif 2, kandungan Fe : 337,385 $\mu\text{g/g}$ dan Pb : 39,483 $\mu\text{g/g}$, dan di kolam pematangan kadar Fe : 333,149 $\mu\text{g/g}$ dan Pb : 38,082 $\mu\text{g/g}$. Kadar Fe di organ ikan pada kolam aerasi fakultatif 1 dan kolam pematangan terjadi penurunan rata-rata sebesar 46,656 $\mu\text{g/g}$ (12,284%), sedang kadar Pb menurun 19,919 $\mu\text{g/g}$ (34,34%). Kandungan Fe telah melebihi standar yang ditetapkan, baik di kolam aerasi fakultatif 1, kolam aerasi 2, maupun di kolam pematangan, sehingga tidak layak dikonsumsi, sedang kandungan Pb masih di bawah standar. Distribusi kandungan Fe pada organ tubuh ikan (kulit, daging, tulang, dan isi perut), rata-rata kandungan logam berat Fe terbanyak pada isi perut ikan, dan paling sedikit pada organ daging ikan nila, sedangkan Pb terbanyak pada organ tulang ikan, dan paling sedikit ada pada organ daging ikan Nila.

Disarankan untuk mengembalikan fungsi ikan sebagai bioindikator dengan menebarkan ikan tersebut di hanya di kolam pematangan. Bagi peneliti lain untuk melakukan penelitian tentang faktor-faktor yang menyebabkan naiknya : kadar BOD dan TSS air limbah di kolam pematangan, kadar Fe pada organ ikan nila di kolam pematangan A, dan kadar Pb pada organ ikan nila di kolam pematangan B, serta jalur distribusi ikan nila di masyarakat.

Kata Kunci : Pengolahan air limbah domestik, logam berat besi dan timah, IPAL Sewon

ABSTRACT

This research was aimed to study the treatment efficiency of Sewon's Waste Water Treatment Plants (WWTP), to decrease the concentrations of lead and iron of nila fish, and also to study the distribution of heavy metals at the skin, flesh, bone, and stomach of nila fish.

This was survey research, it was done by *cross sectional* approach. The analysis was done by *inductive method* (that was) waste water treatment analysed and compared by standard, calculate the removal efficiency, analysis of concumed fish (suitable or no), make advise and conclusion

The results showed that domestic waste water treatment plants can decrease BOD, COD, TSS, Nitrit concentrations of waste water suitable with SK Governor of DIY No. 214/KPTS/1991. *Paired sample test* (probability 0,05) was done between BOD, COD, TSS, Nitrit let and outlet. There were different value statically between before and after treatment, where significancy value of BOD (0,001), COD (0,030), TSS (0,000), nitrit (0,045). Sewon's WWTP was Effecien to decrease BOD, COD, TSS, and Nitrit. Iron concentration of nila fish at the facultative aeration pond 1 average : 379,805 $\mu\text{g/g}$, facultative aeration pond 2 : 337,385, and at the maturation pond : 333,149 $\mu\text{g/g}$. The concentration of iron decrease from facultative aeration pond 1 to maturation pond (46,656 $\mu\text{g/g}$ or 12,284 %). Iron concentration is still over standard, so it is not allowed to consume. Lead concentration of nila fish at the facultative aeration pond 1 average : 58,001 $\mu\text{g/g}$, facultative aeration pond 2 : 39,483 $\mu\text{g/g}$ and at the maturation pond : 38,082 $\mu\text{g/g}$. The concentration of lead decrease from facultative aeration pond 1 to maturation pond (19,919 $\mu\text{g/g}$ or 34,34 %). Lead concentration is still under standard. Distribution of iron heavy metals concentration in the Nila fish body (skin, flesh, bone, and stomach), the average highest concentration is in stomach and lowest concentration is in flesh, while the lead concentration, the average highest concentration is in bone of nila fish and lowest concentration average is in flesh of nila fish

It's advised to return the function of fish as bioindicator only placed on the maturation pond, to research the concentrations of BOD, TSS waste water, Fe and Pb at nila fish in maturation ponds, and also distribution of nila fish in community.

Keyword : domestic waste water treatment, iron and lead heavy metals , Sewon's

WWTP