PASIR, ZEOLIT DAN ARANG AKTIF SEBAGAI MEDIA FILTRASI UNTUK MENURUNKAN KEKERUHAN, TDS DAN *E-COLI* AIR SELOKAN MATARAM YOGYAKARTA

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INTISARI

Air merupakan zat yang terpenting dalam kehidupan setelah udara. Hampir tiga per empat tahun bagian dari tubuh kita adalah air dan tidak ada seorang pun dapat bertahan hidup lebih dari 4-5 hari tanpa minum air. Kualitas air yang buruk dapat menimbulkan berbagai masalah kesehatan. Kadar kekeruhan, TDS dan *E-coli* dapat diturunkan dengan sistem filtrasi menggunakan media filter pasir, zeolit dan arang aktif. Perlakuan satu dengan (media pasir 26 cm, zeolit 26 cm dan arang aktif 26 cm), Perlakuan dua dengan (media pasir 35 cm, zeolit 17 cm dan arang aktif 26 cm) dan perlakuan tiga dengan (media pasir 44 cm, zeolit 17 cm dan arang aktif 17 cm). Tujuan dari penelitian ini adalah perbedaan penurunan Kekeruhan, TDS dan *E-coli* air dengan media filtrasi yang efektif air Sungai Selokan Mataram Yogyakarta.

Penelitian ini merupakan penelitian *Experiment Quasi* dengan desain *Pre-test – Post test Group Design*. Objek pada penelitian ini adalah air Sungai Selokan Mataram Yogyakarta yang memiliki kualitas air yang rendah. Hasil analisa statistik menggunakan ui *One Way Anova* diperoleh nilai signifikatan atau p-value untuk kadar Kekeruhan 0,000 < 0,05, kadar TDS 0,001 < 0,05, dan kadar *E-coli* 0,000 yang menunjukkan adanya perbedaan kadar Kekeruhan, TDS dan *E-coli* antar kelompok perlakuan.

Hasil penelitian ini adalah ada perbedaan bermakna filtrasi dengan media pasir,zeolit dan arang aktif air Sungai Selokan Mataram Yogyakarta. Kemampuan menurunkan kadar Kekeruhan pada perlakuan satu,dua dan tiga berturut-turut sebesar 64,758%, 71,266%, dan 83,674%, kemampuan menurunkan kadar TDS pada perlakuan satu, dua dan tiga berturut-turut sebesar 11,328%, 19,134% dan 21% sedangkan kemampuan menurunkan kadar *E-coli* pada perlakuan satu, dua dan tiga berturut-turut sebesar 44,996%, 72,774% dan 88,886%.

Berdasarkan hasil penelitian dapat disimpulkan bahwa perlakuan tiga (media pasir 44 cm, zeolit 17 cm dan arang aktif 17 cm) mampu menurunkan kadar Kekeruhan, TDS dan *E-coli* paling efektif karena dapat menurunkan paling banyak sampai batas yang diperbolehkan kecuali kadar *E-coli*.

Kata kunci : air, kualitas air, pasir, zeolit dan arang aktif

SAND, ZEOLITE AND ACTIVED CARBON AS FILTRATION MEDIA TO DECREASE TURBIDITY, TDS, AND *E-COLI* OF WATER IN MATARAM SEWER IN YOGYAKARTA

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ABSTRACT

Water is an essential need for life after the air. About three-quarter of our body composition is water and no body could survive for 4 to 5 days without water. Poor water quality could cause some health problems. Turbidity level, TDS level and *E-coli* could be decreased by filtrating system which is use sands, zeolite, and active carbon. First trial consists of (the thick of each media was 26 cm), second trial (sand thick was 35 cm, zeolite thick was 17 cm, and carbon active thick was 17 cm), and the third trial (sand thick was 44 cm, zeolite thick was 17 cm, and carbon active thick was 17 cm). The aim of this study was to know the difference of turbidity level, TDS and *E-coli* of water in Mataram Sewer in Yogyakarta by using an effective media filter.

This was a quasion experiment study with Pretest-Posttest Group Design. Object of this study was the water of Mataram Sewer in Yogyakarta which has poor quality. Statistical analyze result by using *One Way Anova* test suggested that significant or p-value for turbidity level 0,000 < 0,05, TDS level was 0,001 < 0,05, and the amount of *E-coli* was 0,000 which were implied that turbidity level, TDS level, and *E-coli* amount was different for each experiment (trial) group.

The result showed that there were a significant different of filtration by using sand, zeolite and activated carbon on water of Mataram Sewer in Yogyakarta. The ability to lower each turbidity level on first, second, and third trial was 64.758%, 71.266%, dan 83.674%, respectively. The ability to lower each TDS level on first, second, and third trial was 11.328%, 19.134% dan 21%, consecutively, while the ability to reduce the amount of e-coli on first, second, and third trial was 44.996%, 72.774% dan 88.886%, consecutively.

It could be concluded that the third trial (sand thick was 44 cm, zeolite thick was 17 cm, and carbon active thick was 17 cm) was the most effective to lower turbidity level, TDS level, and *E-coli* amount to meet the allowable threshold, except for the amount of *E-coli.*

Key words: *water, water quality, sand, zeolite and activated carbon*