

ABSTRAK

EFEKTIVITAS KOMBINASI *GREASE TRAP* DAN *CONSTRUCTED WETLAND* DALAM PENGELOLAAN AIR TERPRODUKSI DI DESA LEDOK, SAMBONG, BLORA, JAWA TENGAH

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Tambang minyak tradisional di Desa Ledok, Kecamatan Sambong, Kabupaten Blora dapat menimbulkan permasalahan lingkungan akibat aktivitas penambangan yang menghasilkan air terproduksi. Air terproduksi hasil aktivitas penambangan minyak bumi dialirkan langsung menuju badan air tanpa adanya pengelolaan. Baku mutu yang diperbolehkan untuk air sungai dan sejenisnya kelas 3 adalah 1000 mg/L untuk *Total Dissolved Solid* (TDS), 1 mg/L untuk minyak dan lemak, dan 0,05 mg/L untuk Zn. Penelitian ini bertujuan untuk: 1) menganalisis kualitas air terproduksi sebelum dan sesudah melalui pengelolaan menggunakan kombinasi *grease trap* dan *constructed wetland*; 2) menghitung efektivitas konsentrasi TDS, Zn, minyak dan lemak dengan kombinasi *grease trap* dan *constructed wetland*; 3) menentukan arahan pengelolaan air terproduksi berdasarkan percobaan kombinasi sistem *grease trap* dan *constructed wetland*.

Penelitian ini diawali dengan metode survey dan pemetaan untuk menentukan batasan lokasi penelitian. Kemudian dilakukan pengambilan sampel untuk pengambilan sampel air terproduksi pada *outlet* yang menuju badan air penerima menggunakan metode (*purposive sampling*). Kemudian dilanjutkan dengan melakukan pengujian sampel kualitas air terproduksi awal dan dilanjutkan uji rancangan percobaan dengan menyusun bak rancangan percobaan yang digunakan sebanyak 6 box kontainer. Bak tersebut meliputi bak penampung awal, bak kontrol, bak *grease trap*, bak kombinasi *grease trap* dan *constructed wetland*, dan bak *constructed wetland* untuk pengelolaan air terproduksi. Hasil pengelolaan kemudian dilakukan pengujian sampel pada hari ke 4 dan hari ke 8 yang kemudian dilakukan analisis hasil dengan metode analisis matematis dan deskriptif dalam bentuk grafik digunakan untuk mengetahui efektivitas penurunan dari pengelolaan yang dilakukan.

Hasil uji laboratorium menunjukkan tingginya kadar TDS 9120 mg/L, Minyak dan lemak 96,7 mg/L, serta Zn 0,69 mg/L yang jauh diatas baku mutu yang ditetapkan Oleh Peraturan Pemerintah Nomor 22 Tahun 2021 untuk air sungai kelas 3. Hasil efektivitas konsentrasi TDS masih belum memenuhi baku mutu yang ditetapkan dengan nilai penyisihan 57,01 % pada bak kombinasi *grease trap* dan *constructed wetland*. Kandungan logam Zn pada air terproduksi didapati nilai efektivitas 94,20 %. Sedangkan kadar minyak dan lemak mengalami penyisihan dengan hasil efektivitas sebesar 99,10 %. Rekomendasi arahan pengelolaan adalah pembuatan kolam *grease trap* dan *constructed wetland* menggunakan tanaman apu - apu dan media filter pasir, zeolite, kerikil dengan dinding semen dengan 2 kali resirkulasi dan 2 kompartemen kolam *constructed wetland* serta kolam penataan baku mutu air limbah untuk mengolah air terproduksi dengan debit 600 L perhari.

Kata kunci: *Constructed wetland*, *Grease trap*, Minyak dan Lemak, Tanaman Apu - apu, TDS, Zn

ABSTRACT

EFFECTIVENESS OF GREASE TRAP AND CONSTRUCTED WETLAND COMBINATION IN PRODUCED WATER MANAGEMENT IN LEDOK VILLAGE, SAMBONG, BLORA, CENTRAL JAVA

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Traditional oil mining in Ledok Village, Sambong Subdistrict, Blora Regency can cause environmental problems due to mining activities that produce produced water. Produced water from petroleum mining activities is flowed directly into water bodies without any management. The quality standard allowed for river water and the like class 3 is 1000 mg/L for Total Dissolved Solid (TDS), 1 mg/L for oil and fat, and 0.05 mg/L for Zn. This study aims to: 1) analyze the quality of produced water before and after management using a combination of grease trap and constructed wetland; 2) calculate the effectiveness of reducing the concentration of TDS, Zn, oil and fat with a combination of grease trap and constructed wetland; 3) determine the direction of produced water management based on the experiment of a combination of grease trap and constructed wetland systems.

This research began with a survey and mapping method to determine the boundaries of the research location. Then sampling was carried out sampling for produced water sampling at the outlet to the receiving water body using a purposive sampling method. Receiving water body using purposive sampling method. Then continued by conducting preliminary produced water quality sample testing and continued with the the experimental design test by arranging the experimental design basin used, as many as many as 6 container boxes. The tubs include an initial collection tub, a control, grease trap, combination of grease trap and constructed wetland, and constructed wetland for water management. Wetland, and constructed wetland for produced water management. produced water. The results of the management were then tested on day 4 and day 8. Day 4 and day 8 and then analyzed the results with the method of mathematical and descriptive analysis in the form of graphs. Mathematical and descriptive analysis methods in the form of graphs used to determine the effectiveness of the reduction of the management carried out.

Laboratory test results show high levels of TDS 9120 mg/L, Oil and fat 96.7 mg/L, and Zn 0.69 mg/L which are far above the quality standards set by Government Regulation No. 22 of 2021 for class 3 river water. The results of the effectiveness of TDS concentration still do not meet the established quality standards with a removal value of 57.07% in the combination of grease trap and constructed wetland basin. The Zn metal content in produced water was found to have an effectiveness value of 94.20%. While the levels of oil and fat experienced removal with an effectiveness of 99.10%. Recommendations for management direction are the construction of grease trap and constructed wetland ponds using apu wood plants and filter media of sand, zeolite, gravel with cement walls with 2 recirculation times and 2 compartments of constructed wetland ponds and wastewater quality standards compliance ponds to treat produced water with a discharge of 600 L per day.

Keywords: Constructed wetland, Grease trap, Oil and Fat, Apu Wood Plant (Pistia Stratiotes L.), TDS, Zn