ABSTRACT

DINO RINALDI. Application of Continuous Wetland Reactor Using Vetiver Plants (Vetiveria zizanioides) and Bacteria to Degradate *Ammonia*, BOD (*Biochemical Oxygen Demand*) and COD (*Chemical Oxygen Demand*) from Industry X Oil Waste in Yogyakarta. Supervised by JONI ALDILLA FAJRI and DEWI WULANDARI.

The oil waste produced by Industry X from its operational activities can pollute the environment if it is disposed of without prior processing. The oil content in wastewater can be reduced through biological processing. This study aims to determine the performance of continuous wetlands reactors combined with Floating and Constructed Wetlands using vetiver grass (Vetiveria zizanioides) and bacteria to reduce the levels of Degradate Ammonia, BOD (Biochemical Oxygen Demand) and COD (Chemical Oxygen Demand) in wastewater from Industry X in Yogyakarta. Wastewater and bacteria are filled into the reactor with a combination of floating wetland (compartment 1), constructed wetland I (compartment 2), constructed wetland II (compartment 3) with detention time of 5 days. Sample testing was carried out on days 0, 6, 11, 16, 21, and 26. The results showed that continuous wetland reactors using vetiver grass and bacteria could reduce the concentration of Ammonia by 2,69-95.02%, COD (Chemical Oxygen Demand) at 20,55-65,38% and BOD (Biochemical Oxygen Demand) 1-59,60%.

***Keywords**: Constructed wetland, continuous wetland, floating wetland, oil waste, Vetiveria zizanioides.*

ABSTRAK

DINO RINALDI. Unjuk Kerja Reaktor *Continous Wetland* Menggunakan Tanaman Vetiver (*Vetivera Zizaniodes*) & Bakteri Untuk Mendegradasi Kandungan *Ammonia*, BOD (*Biochemical Oxygen Demand*) dan COD (*Chemical Oxygen Demand*) Limbah Minyak Dari Industri X Yogyakarta. Dibimbing oleh JONI ALDILLA FAJRI dan DEWI WULANDARI.

Limbah minyak yang dihasilkan oleh Industri X dari kegiatan operasionalnya dapat mencemari lingkungan jika dibuang tanpa dilakukan pengolahan terlebih dahulu. Kandungan minyak di air limbah tersebut dapat dikurangi melalui upaya pengolahan secara biologis. Penelitian ini bertujuan untuk mengetahui kinerja reaktor *continuous wetlands* kombinasi *Floating* dan *Constructed Wetlands* dengan menggunakan rumput vetiver (*Vetiveria zizanioides*) dan bakteri untuk mengurangi kandungan *Ammonia*, BOD (*Biochemical Oxygen Demand*) dan COD (*Chemical Oxygen Demand*). Air limbah dan bakteri dimasukkan ke dalam reaktor dengan kombinasi *floating wetland* (kompartemen 1), *constructed wetland* I (kompartemen 2), *constructed wetland* II (kompartemen 3) dengan waktu tinggal 5 hari. Pengujian sampel dilakukan pada hari ke-0, 6, 11, 16, 21, dan 26. Hasil penelitian menunjukkan reaktor *continuous wetland* menggunakan tanaman rumput vetiver serta bakteri dapat mengurangi kandungan *Ammonia* sebesar 2,69-95.02%, COD (*Chemical Oxygen Demand*) 20,55-65,38% dan BOD (*Biochemical Oxygen Demand*) 1-59,60%

Kata kunci: *Constructed wetland*, *floating wetland*, limbah minyak, reaktor *continuous wetlands*, *vetiveria zizanioides*