

## ABSTRAK

### **ANALISIS KUALITAS AIR TANAH DAN AIR PERMUKAAN PADA LAND APPLICATION DI PT. BRAHMA BINA BAKTI**

Ria Hikmarina<sup>1</sup>, Drs. Guntar Marolop Saragih, M. Si<sup>2</sup>, Ir. Marhadi, ST, M.Si<sup>3</sup>

#### **ABSTRAK**

Penerapan teknologi *land application* pada pabrik kelapa sawit merupakan salah satu metode pengelolaan limbah cair yang bertujuan untuk mengurangi pencemaran lingkungan sekaligus meningkatkan kesuburan tanah. Namun demikian, aplikasi limbah cair ke lahan berpotensi memberikan dampak terhadap kualitas air tanah dan air permukaan di sekitarnya. Penelitian ini bertujuan untuk menganalisis kualitas air tanah dan air permukaan pada area *land application* di PT. Brahma Bina Bakti, Kabupaten Muaro Jambi, serta mengevaluasi kesesuaiannya terhadap baku mutu lingkungan yang berlaku. Penelitian ini menggunakan metode deskriptif kuantitatif dengan pengambilan sampel air limbah pada outlet IPAL, air permukaan pada Sungai Sekawan (titik hulu dan hilir), serta air tanah pada sumur pantau dan sumur kontrol. Pengambilan sampel dilakukan berdasarkan SNI 8995:2021 dan SNI 8990:2021, kemudian dianalisis di laboratorium untuk parameter pH, BOD, COD, TSS, dan amonia (NH<sub>3</sub>). Hasil analisis dibandingkan dengan baku mutu air permukaan dan air tanah berdasarkan Peraturan Pemerintah Nomor 22 Tahun 2021 serta baku mutu limbah cair berdasarkan PERMENLHK Nomor 5 Tahun 2014. Hasil penelitian menunjukkan bahwa kualitas air limbah pada outlet IPAL telah memenuhi baku mutu yang ditetapkan. Namun, pada air permukaan Sungai Sekawan dan air tanah di sekitar area *land application* ditemukan kecenderungan peningkatan beberapa parameter pencemar, terutama BOD, COD, TSS, dan amonia, meskipun sebagian besar masih berada dalam ambang batas baku mutu. Hal ini mengindikasikan bahwa penerapan *land application* berpotensi memengaruhi kualitas air di sekitar lokasi apabila tidak dikelola dan dipantau secara berkelanjutan. Oleh karena itu, diperlukan pengawasan dan pengelolaan yang lebih optimal guna menjaga kelestarian sumber daya air dan keberlanjutan lingkungan.

Kata kunci: *land application, limbah cair kelapa sawit, kualitas air tanah, kualitas air permukaan, lingkungan.*

## **ABSTRACT**

### ***ANALYSIS OF GROUNDWATER AND SURFACE WATER QUALITY IN LAND APPLICATION AT PT. BRAHMA BINA BAKTI***

Ria Hikmarina<sup>1</sup>, Drs. Guntar Marolop Saragih, M. Si<sup>2</sup>, Ir. Marhadi, ST, M.Si<sup>3</sup>

#### **ABSTRACT**

*The implementation of land application technology in palm oil mills is one of the wastewater management methods aimed at reducing environmental pollution while improving soil fertility. However, the application of treated wastewater to land has the potential to affect the quality of groundwater and surface water in the surrounding area. This study aims to analyze the quality of groundwater and surface water in the land application area of PT. Brahma Bina Bakti, Muaro Jambi Regency, and to evaluate its compliance with applicable environmental quality standards. This study employed a descriptive quantitative method by collecting wastewater samples at the outlet of the wastewater treatment plant (WWTP), surface water samples from the Sekawan River (upstream and downstream points), and groundwater samples from monitoring wells and control wells. Sampling was conducted in accordance with SNI 8995:2021 and SNI 8990:2021, and laboratory analyses were carried out for pH, BOD, COD, TSS, and ammonia (NH<sub>3</sub>). The analytical results were compared with surface water and groundwater quality standards based on Government Regulation Number 22 of 2021, as well as wastewater quality standards based on Regulation of the Minister of Environment and Forestry Number 5 of 2014. The results indicate that the wastewater quality at the WWTP outlet has met the established quality standards. However, surface water in the Sekawan River and groundwater around the land application area show a tendency for increased levels of several pollution parameters, particularly BOD, COD, TSS, and ammonia, although most values remain within the permissible limits. This indicates that land application has the potential to influence water quality in the surrounding area if not properly managed and monitored on a continuous basis. Therefore, improved management and regular monitoring are required to maintain water resource sustainability and environmental preservation.*

*Keywords: land application, palm oil mill effluent, groundwater quality, surface water quality, environment.*