

**OPTIMALISASI KOLAM ANAEROBIK DAN KOLAM MATURASI
TERHADAP PENURUNAN KADAR BOD, COD, DAN *TOTAL COLIFORM*
INSTALASI PENGOLAHAN LUMPUR TINJA BAKUNG KOTA BANDAR
LAMPUNG**

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INTISARI

Instalasi Pengolahan Lumpur Tinja (IPLT) Bakung Kota Bandar Lampung berperan penting dalam mengolah limbah domestik agar tidak mencemari lingkungan. Namun, kualitas efluen hasil pengolahan masih belum memenuhi baku mutu air limbah domestik sesuai PERMENLHK No. 68 Tahun 2016, khususnya pada parameter BOD, COD, dan *Total Coliform*. Penelitian ini bertujuan untuk menganalisis kinerja dan efisiensi kolam anaerobik serta kolam maturasi dalam menurunkan kadar pencemar, sekaligus merancang upaya optimalisasi pengolahan.

Metode penelitian yang digunakan adalah kuantitatif dan kualitatif, melalui pengujian laboratorium parameter BOD, COD, dan *Total Coliform*, serta evaluasi efisiensi tiap unit pengolahan. Data diperoleh dari hasil survei lapangan, observasi langsung, dan analisis sekunder IPLT Bakung.

Hasil penelitian menunjukkan bahwa efisiensi pengolahan IPLT Bakung mengalami peningkatan setelah IPLT aktif kembali, bermula dengan nilai efisiensi pengolahan tahun 2023 adalah 43,92% untuk parameter BOD, 44,36% untuk parameter COD, dan 34,78% untuk parameter *Total Coliform*, kemudian meningkat menjadi 99%, 99%, dan 100% untuk efisiensi pengolahan parameter BOD, COD, dan *Total Coliform* berdasarkan hasil pengujian laboratorium. Kualitas efluen IPLT Bakung pada tahun 2024 masih belum memenuhi baku mutu yang digunakan walaupun efisiensi pengolahan telah menunjukkan nilai yang bagus. Upaya optimalisasi yang direkomendasikan meliputi pengalihfungsian kolam *sludge drying bed* menjadi kolam sedimentasi, penerapan sistem *Sequencing Batch Reactor* (SBR) pada kolam anaerobik dan aerasi untuk mengubah proses pengolahan secara siklus, serta penyusunan SOP perawatan kolam maturasi untuk meningkatkan desinfeksi secara biologis. Hasil penelitian ini diharapkan dapat menjadi rekomendasi dasar perbaikan desain dan operasional IPLT Bakung agar memenuhi standar lingkungan dan meningkatkan efektivitas pengolahan limbah domestik.

Kata kunci: BOD, COD, *Total Coliform*, IPLT Bakung

OPTIMIZATION OF ANAEROBIC AND MATURATION PONDS FOR REDUCING BOD, COD, AND TOTAL COLIFORM LEVELS AT THE BAKUNG FAECAL SLUDGE TREATMENT PLANT, BANDAR LAMPUNG CITY

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ABSTRACT

The Faecal Sludge Treatment Plant (IPLT) Bakung in Bandar Lampung City plays an important role in treating domestic wastewater to prevent environmental pollution. However, the quality of the treated effluent still does not meet the domestic wastewater quality standards as stated in the Regulation of the Minister of Environment and Forestry (PERMENLHK) No. 68 of 2016, particularly for the parameters of BOD, COD, and Total Coliform. This study aims to analyze the performance and efficiency of the anaerobic and maturation ponds in reducing pollutant concentrations, as well as to design optimization strategies for improving the treatment process.

The research employed quantitative and qualitative methods, involving laboratory testing of BOD, COD, and Total Coliform parameters, along with the evaluation of the efficiency of each treatment unit. Data were obtained through field surveys, direct observations, and secondary data analysis from IPLT Bakung.

The study indicates that the treatment efficiency of the Bakung FSTP improved after the facility resumed operation. In 2023, removal efficiencies were recorded at 43.92% for BOD, 44.36% for COD, and 34.78% for Total Coliform, which later increased to 99%, 99%, and 100%, respectively, based on laboratory test results. However, despite the high treatment efficiency, the effluent quality of the Bakung FSTP in 2024 still did not comply with the applicable discharge standards. Recommended optimization measures include converting the sludge drying bed into a sedimentation pond, implementing a Sequencing Batch Reactor (SBR) system in the anaerobic and aeration ponds to enable cyclic treatment processes, and developing standard operating procedures (SOPs) for maturation pond maintenance to enhance biological disinfection. These findings are expected to serve as key recommendations for improving the design and operation of the Bakung FSTP in order to meet environmental standards and enhance the effectiveness of domestic wastewater treatment.

Keywords: BOD, COD, Total Coliform, IPLT Bakung