ABSTRAK

KARAKTERISTIK DAN KELIMPAHAN MIKROPLASTIK PADA *WATER TREATMENT PLANT* (WTP) PERUMDA TIRTA MERANGIN

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xiii + 87 halaman, 12 tabel, 22 gambar, 7 lampiran

ABSTRAK

Mikroplastik telah ditemukan di sungai-sungai sumber air baku, termasuk Sungai Batang Merangin yang memasok 90% air olahan Perumda Tirta Merangin. Kondisi ini memicu kekhawatiran akan kontaminasi mikroplastik dalam air olahan, penelitian ini bertujuan untuk mengidentifikasi karakteristik dan kelimpahan mikroplastik di Water Treatment Plant (WTP) Perumda Tirta Merangin, Kabupaten Merangin. Penelitian menggunakan metode deskriptif kuantitatif dan eksperimen dengan sampel air dari setiap unit pengolahan (intake air baku, koagulasi, flokulasi, sedimentasi, filtrasi, dan reservoir) yang dianalisis di Laboratorium Ecoton, Gresik. Hasilnya menunjukkan ada tiga jenis mikroplastik: fiber (47 partikel), filamen (38 partikel), dan fragmen (5 partikel), total 90 partikel. Warna dominan mikroplastik adalah biru (39%) dengan ukuran <0,1 mm hingga >2 mm. Efisiensi penyisihan Mikroplastik pada Perumda Tirta Merangin mengalami fluktuasi pada tiap unit kecuali pada unit sedimentasi, efisiensi penyisihan pada AB > US > UK > UFI > UFO > UR atau sama dengan 61,9% > 57,9% > 50% > 50% > 20% > 0% . Indeks Polymer Risk (PRI >100) dan Pollution Load Index (PLI >20) menunjukkan risiko lingkungan dan kesehatan. Penelitian ini diharapkan mendukung peningkatan teknologi pengolahan air dan pengurangan kontaminasi mikroplastik.

Kata Kunci: Mikroplastik; *Water Treatment Plant* (WTP); Perumda Tirta Merangin; Efisiensi Penyisihan; *Polymer Risk Index; Pollution Load Index.*

ABSTRACT

CHARACTERISTICS AND ABUNDANCE OF MICROPLASTICS AT THE WATER TREATMENT PLANT (WTP) OF PERUMDA TIRTA MERANGIN

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ABSTRACT

Microplastics have been found in raw water source rivers, including the Batang Merangin River, which supplies 90% of the treated water for Perumda Tirta Merangin. This condition raises concerns about microplastic contamination in the treated water. This study aims to identify the characteristics and abundance of microplastics in the Water Treatment Plant (WTP) of Perumda Tirta Merangin, Merangin Regency. The research used descriptive quantitative and experimental methods with water samples taken from each processing unit (raw water intake, coagulation, flocculation, sedimentation, filtration, and reservoir) analyzed at the Ecoton Laboratory, Gresik. The results showed three types of microplastics: fiber (47 particles), filament (38 particles), and fragment (5 particles), totaling 90 particles. The dominant microplastic color was blue (39%), with sizes ranging from <0.1 mm to >2 mm. The microplastic removal efficiency at Perumda Tirta Merangin showed fluctuations in each unit except in the sedimentation unit, with removal efficiencies as follows: AB > US > UK > UFI > UFO > UR, (61.9%) > (57.9%) > (50%) > (50%) > (20%) > (0%). The Polymer Risk Index (PRI >100) and Pollution Load Index (PLI >20) indicated environmental and health risks. This study is expected to support the improvement of water treatment technology and reduce microplastic contamination.

Keywords: *Microplastic; Water Treatment Plant (WTP); Perumda Tirta Merangin; Removal Efficiency; Polymer Risk Index; Pollution Load Index*