TEKNIK PENGOLAHAN AIRTANAH KAWASAN INDUSTRI TEKSTIL DI DESA PURWOSUMAN DAN DESA PATIHAN, KECAMATAN SIDOHARJO, KABUPATEN SRAGEN, PROVINSI JAWA TENGAH

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INTISARI

Limbah cair industri tekstil di Desa Patihan dan Purwosuman belum dikelola dengan baik, limbah cair dialirkan menuju sungai. Industri tekstil diindikasikan menggunakan bahan kimia sintetis yang mengandung logam berat tembaga (Cu), kemudian mempengaruhi status mutu airtanah di lokasi penelitian. Metode penelitian yang digunakan yaitu survey dan pemetaan, indeks pencemaran, laboratorium, dan wawancara. Parameter kualitas airtanah yang diuji yaitu parameter fisik (suhu, bau, rasa, TDS); parameter kimia (pH, tembaga, dan fosfat); dan parameter biologi (*total coliform)*, disesuaikan dengan baku mutu Peraturan Menteri Kesehatan Nomor 492/MENKES/PER/IV/2010 tentang Persyaratan Kualitas Air Minum. Metode percobaan pengolahan airtanah menggunakan saringan pasir dan adsorpsi karbon aktif. Wawancara digunakan untuk mengetahui kebutuhan air warga sehari-hari.

Hasil penelitian menunjukkan kondisi status mutu airtanah di daerah penelitian dalam kondisi tercemar ringan dan tidak layak untuk dikonsumsi dengan adanya parameter yang melebihi baku mutu (Cu, TDS, dan Fosfat). Kualitas airtanah di lokasi penelitian dipengaruhi oleh jarak sumur dengan sumber pencemar. Efisiensi optimum karbon aktif dalam mengadsorpsi ion Cu sebesar 50% dari nilai 0,04 mg/L menjadi 0,02 mg/L dengan tinggi kolom 70 cm pada waktu 30 menit. Efisiensi karbon aktif optimum dalam mengadsorpsi fosfat sebesar 15,7% dari nilai 3,12 mg/L menjadi 2,63 mg/L dengan tinggi kolom 50 cm pada waktu 30 menit. Efisiensi optimum karbon aktif dalam mengadsorpsi TDS sebesar 32,33% dari nilai 1655 mg/L menjadi 1120 mg/L dengan tinggi kolom 70 cm pada waktu 30 menit. Berdasarkan hasil tersebut, arahan pengelolaan yang direkomendasikan untuk pengolahan airtanah di kawasan industri tekstil berupa metode adsorpsi karbon aktif yang dapat menurunkan nilai Cu, fosfat, dan TDS.

Kata Kunci: Airtanah, Status Mutu Airtanah, Adsorpsi Karbon Aktif

GROUNDWATER TREATMENT TECHNIQUE IN TEXTILE INDUSTRY AREA AT PURWOSUMAN VILLAGE AND PATIHAN VILLAGE, SIDOHARJO SUBDISTRICT, SRAGEN DISTRICT, CENTRAL JAVA PROVINCE

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ABSTRACT

Waste water of textile industry in the village of Patihan and Purwosuman has not been managed well; the liquid waste is disposed through river streams. Textile industries use synthetic chemical materials containing heavy metal such as Copper (Cu), which is affecting the groundwater quality status of the research site.The research methods used were survey and mapping, pollution index, laboratory, and interview. The tested groundwater quality parameters were physical parameter (temperature, smell, taste, TDS); chemical parameter (pH, copper, and phosphate); and biological parameter (total coliform), in accordance with the quality standars stated in Minister of Health Regulation Number 492/MENKES/PER/IV/2010 regarding Quality Requirements of Drinking Water. The groundwater processing test method used sand sieve and activated carbon adsorption. The interview method was used to understand daily water needs of the locals.

The research result showed that the groundwater quality status of the research site was lightly polluted and was not suitable for consumption because of the parameter was not according to quality standards (Cu, TDS, and Phosphate). The groundwater quality of the research site was affected by the fact that the distance of wells and source of pollutant was close. The optimum effectivity of activated carbon adsorption of Cu ion was 50% from the value of 0,04 mg/L which then became 0,02 mg/L with 70 cm, column height in 30 minutes. The optimum effectivity of activated carbon adsorption of phosphate was 15,7% from the value of 3,12 mg/L which then became 2,63 mg/L with 50 cm column height in 30 minutes. The optimum effectivity of activated carbon adsorption of TDS was 32,33% from the value of 1655 mg/L which then became 1120 mg/L with 70 cm column height in 30 minutes. Based on result, the recommended management for the groundwater in the textile industry area is activated carbon adsorption method which reduces Cu, TDS, and Phosphate values.

Keywords: ***Groundwater, Groundwater Quality Status, Activated Carbon Adsorption***