

TEKNIK PENGOLAHAN AIRTANAH TERCEMAR LOGAM BERAT MERKURI (Hg) AKIBAT PERTAMBANGAN EMAS RAKYAT SEBAGAI KEBUTUHAN AIR BERSIH DI DESA PANINGKABAN, KECAMATAN GUMELAR, KABUPATEN BANYUMAS, PROVINSI JAWA TENGAH

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Intisari

Pertambangan emas rakyat di Desa Paningkaban, Kecamatan Gumelar, Kabupaten Banyumas, Provinsi Jawa Tengah masih secara tradisional dan belum melakukan pengolahan terhadap tailing. Kondisi tersebut berpotensi mencemari tanah dan airtanah di kawasan tersebut. Perlu adanya pengawasan terhadap kegiatan pertambangan tersebut dalam hal pengolahan yang menggunakan Merkuri (Hg), sehingga dapat menekan jumlah Merkuri (Hg) yang dapat berpotensi mencemari lingkungan. Penelitian ini bertujuan untuk menganalisis berapa besar status mutu air yang disebabkan adanya pencemaran logam berat Merkuri (Hg) di airtanah dan menganalisis efektifitas teknik pengolahan airtanah tercemar logam berat (Hg) dengan media zeolit dan bentonit di lokasi penelitian.

Metode yang digunakan adalah survey dan pemetaan, analisis laboratorium, wawancara, analisis deskriptif, dan metode Indeks Pencemaran. Jumlah sampel air yang diambil sebanyak 8 sampel, meliputi 5 sampel airtanah dan 3 sampel air sungai. Pengambilan sampel airtanah dan air sungai menggunakan Teknik *Purposive Sampling*. Pengujian kualitas air dengan parameter fisika (bau, rasa, TSS, TDS, dan suhu), parameter kimia (pH, dan Merkuri (Hg)). Baku mutu yang digunakan yaitu Peraturan Pemerintah Republik Indonesia No 82 Tahun 2001 dan Peraturan Menteri Kesehatan Republik Indonesia Nomor 416/MENKES/PER/IX/1990. Metode pengolahan airtanah tercemar menggunakan Metode Adsorpsi dengan media Zeolit dan Bentonit dengan membandingkan variabel dari media Zeolit dan Bentonit.

Hasil penelitian menunjukkan airtanah tercemar di lokasi penelitian memiliki status mutu air tercemar sedang didapat dari perhitungan dengan menggunakan Metode Indeks Pencemaran, dan tidak dapat digunakan sebagai air baku air bersih dan air minum. Penurunan kualitas airtanah tercemar di lokasi penelitian dipengaruhi dari jarak terhadap pertambangan emas rakyat di Desa Paningkaban sebagai sumber pencemar dan mengikuti arah aliran. Efektifitas zeolit dan bentonit yang teraktifasi dengan perbandingan 50 cm: 0 cm sebagai adsorben parameter Merkuri (Hg) sebesar 91,6% yang mempunyai waktu tinggal 120 menit, sedangkan parameter *Total Dissolved Solid* (TDS) sebesar 76,31% dengan waktu tinggal 120 menit. Teknik pengolahan airtanah bebas menggunakan Metode Adsorpsi Zeolit mampu menurunkan kandungan Merkuri (Hg) dan *Total Dissolved Solid* (TDS) di airtanah sehingga dapat digunakan untuk kebutuhan air baku masyarakat di lokasi penelitian.

Kata Kunci: Kualitas airtanah, Tercemar sedang, Adsorpsi Zeolit.

GROUND WATER TREATMENT TECHNIQUE POLLUTED BY MERKURI (Hg) METAL DUE TO PUBLIC GOLD MINING AS THE NEED OF CLEAN WATER IN PANINGKABAN VILLAGE, GUMELAR SUB DISTRICT, BANYUMAS REGENCY, CENTRAL JAVA PROVINCE

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Abstract

The public gold mining in Paningkaban Village, Gumelar Sub-district, Banyumas Regency, Central Java Province is still traditional and has not yet done tailings treatment so that it potentially contaminates soil and groundwater in the area. It is necessary to supervise the mining activities in case of processing using Mercury (Hg), so the amount of mercury (Hg) that can potentially pollute the environment can be suppressed. The aims of this research are to know how big water quality status of mercury (Hg) in groundwater and to know the effectiveness of polluted water processing technique in the research location.

The methods use survey and mapping, laboratory analysis, interview, descriptive analysis, and pollution index (IP). The numbers of groundwater samples are taken from 5 locations based on the direction of groundwater flow and river water are taken from 3 locations. Water quality testing is performed in the laboratory with physical parameters of (smell, taste, TSS, TDS, and temperature), chemical parameters of (pH, and Mercury (Hg)). The standard qualities are Government Regulation of Republic of Indonesia No 82 in 2001 and Regulation of Health Minister of Republic of Indonesia No. 416/MENKES/PER/IX/1990. The method of polluted groundwater treatment is using Adsorption Method with Zeolite and Bentonite by comparing the variables of Zeolite and Bentonite.

The results show that polluted groundwater in research location has water quality status medium pollution and is not suitable for use as raw water for consumption. The deterioration of the polluted groundwater quality at the study location is influenced by the distance to the public gold mining in Paningkaban Village as a source of pollutants and following the flow direction. The effectiveness of activated Zeolite and Bentonite by comparing 50 cm: 0 cm as a mercury (Hg) parameter adsorbent is 91.6% with 120 minutes remaining time, and Total Dissolved Solid (TDS) is 76.31% with 120 minutes remaining time. Groundwater treatment technique by using Zeolite Adsorption Method can decrease mercury (Hg) and Total Dissolved Solid (TDS) content in groundwater so that it can be used for the community's raw water consumption in the research location.

Keywords: Groundwater Quality, Medium Pollution, Zeolite Adsorption.