PENGENDALIAN PENCEMARAN INDUSTRI KERAJINAN LOGAM TERHADAP KUALITAS AIR BAWAH TANAH DI DESA PURBAYAN DAN DESA PRENGGAN, KECAMATAN KOTAGEDE, KOTA YOGYAKARTA DAN DESA JAGALAN, KECAMATAN BANGUNTAPAN KABUPATEN BANTUL, DAERAH ISTIMEWA YOGYAKARTA

Oleh

RA Larasati Damarswasty
114170038

INTISARI

Indonesia memiliki banyak sentra industri kerajinan logam yang salah satunya terletak di Desa Purbayan dan Desa Prenggan, Kecamatan Kotagede, Kota Yogyakarta dan Desa Jagalan, Kecamatan Banguntapan Kabupaten Bantul, Daerah Istimewa Yogyakarta. Limbah cair industri kerajinan logam yang belum diolah dan langsung dibuang ke lubang resapan tanah dapat meningkatkan potensi pencemaran air bawah tanah. Limbah cair memiliki potensi kandungan yang berbahaya seperti logam Cu, Ag, dan Ni dan dapat menurunkan kualitas air bawah tanah. Oleh karena itu penelitian ini memiliki tujuan yaitu mengetahui kualitas air limbah industri kerajinan logam, status mutu air bawah tanah, tingkat kerentanan air bawah tanah terhadap pencemaran, dan menentukan arahan pengendalian pencemaran.

Penelitian ini dilakukan dengan metode kombinasi meliputi pengambilan data, pengolahan data, dan analisis hasil data. Pengumpulan data dilakukan dengan survey, pemetaan lapangan, uji kualitas sampel air, dan percobaan laboratorium. Pengambilan sampel air bawah tanah dengan *purposive sampling*. Analisis status mutu air bawah tanah menggunakan metode Indeks Pencemaran dan analisis tingkat kerentanan dengan DRASTIC. Model arahan pengolahan limbah dilakukan dengan percobaan skala laboratorium dan dilanjutkan perancangan desain IPAL komunal metode presipitasi skala lapangan.

Hasil penelitian menunjukan kualitas air limbah industri kerajinan logam melebihi baku mutu di parameter pH, TSS, TDS, Cu, Ni, dan Ag. Status mutu air bawah tanah terbagi menjadi dua kelas yaitu tercemar sedang dan tercemar ringan. Daerah penelitian memiliki tingkat kerentanan air bawah tanah sangat tinggi terhadap pencemaran dengan skor ≥153 yang mencakup seluruh daerah penelitian. Percobaan laboratorium dengan metode presipitasi memberikan efektivitas penurunan tertinggi dengan presipitan NaOH 15% mencapai 66,5976% untuk Ni, 34,0813% untuk Ag, dan 19,3429% untuk Cu. Hasil akhir kualitas limbah setelah percobaan menunjukan beberapa parameter belum memenuhi baku mutu yang berlaku, sehingga membutuhkan penyesuaian untuk dapat diaplikasikan di daerah penelitian.

Kata Kunci: Air Bawah Tanah, Industri Kerajinan Logam, Kerentanan, Presipitasi

POLLUTION CONTROL OF THE METAL CRAFT INDUSTRY ON THE QUALITY OF UNDERGROUND WATER IN PURBAYAN VILLAGE AND PRENGGAN VILLAGE, KOTAGEDE DISTRICT, YOGYAKARTA CITY AND JAGALAN VILLAGE, BANGUNTAPAN DISTRICT, BANTUL REGENCY, SPECIAL REGION OF YOGYAKARTA

By

RA Larasati Damarswasty
114170038

ABSTRACT

Indonesia has many metal craft industry centers, one of which is located in Purbayan Village, Prenggan Village, Kotagede District, Yogyakarta City and Jagalan Village, Banguntapan District, Bantul Regency, Special Region of Yogyakarta. The liquid waste of the metal craft industry that has not been treated properly and directly dumped into the ground can increase the potential for groundwater pollution Liquid waste has the potential to contain hazardous metals such as Cu, Ag, and Ni and can reduce the quality of underground water. Therefore, the purpose of this study is to determine the quality of the metal craft industry wastewater, the status of underground water quality, the level of vulnerability of underground water to pollution, and determine the direction of pollution control.

The method used in this research is a combination method. Data were collected using surveys, field mapping, testing the quality of water samples, and laboratory experiments. Groundwater sampling by purposive sampling method. Analysis of groundwater quality status using the Pollution Index method and vulnerability level analysis using DRASTIC. The directive model for waste treatment is carried out by laboratory-scale experiments and continued with the design of communal WWTPs with field-scale precipitation methods.

The results showed that the quality of the metal craft industry wastewater exceeded the quality standards in the parameters of pH, TSS, TDS, Cu, Ni, and Ag. The groundwater quality status is divided into two classes, namely moderately polluted and lightly polluted. The research area has a very high level of groundwater vulnerability to pollution (score ≥ 153) which covers the entire research area. Laboratory experiments using the precipitation method gave the highest reduction effectiveness with 15% NaOH precipitation reaching 66.5976% for Ni, 34.0813% for Ag, and 19.3429% for Cu. The final results of the quality of the waste after the experiment showed that several parameters did not meet the applicable quality standards, thus requiring adjustments to be applied in the research area.

Keywords: *Groundwater, Metal Craft Industry, Vulnerability, Precipitation*