ABSTRAK

Air tanah merupakan sumber air berharga bagi masyarakat di Kecamatan Cangkringan untuk memenuhi kebutuhan sehari-hari. Interaksi antara air tanah dan mineral penyusun akuifer serta aktivitas antropogenik memberi pengaruh besar terhadap kimia air tanah. Oleh Karena itu, penelitian ini berguna untuk mengetahui karakteristik hidrokimia air tanah, kualitas air tanah serta menentukan konektivitas hidrolika dan membuat model konseptual akuifer agar mengetahui kondisi hidrogeologi dan hidrokimia daerah penelitian. Tahapan penelitian diawali dengan observasi hidrogeologi umum, penentuan titik pengambilan sampel, pengambilan sampel air tanah analisis laboratorium. Setelah dilakukan analisis laboratorium kandungan ion mayor air tanah pada kawasan Cangkringan mengikuti urutan Na;Ca;K;Mg dan HCO3;SO4;Cl;NO3. Terdapat empat fasies air tanah utama berdasarkan diagram piper, yaitu alkali bikarbonat, alkali klorida, kalsium magnesium bikarbonat dan kalsium magnesium klorida. Sedangkan berdasarkan klasifikasi kurlov terdapat 3 kelas yaitu Na+K;Mg;Ca dengan HCO3;SO4;Cl, Na+K;Mg;Ca dengan HCO3;Cl;SO4 dan Na+K;Ca;Mg dengan HCO3;SO4;Cl. Air tanah di daerah penelitian memiliki pola yang cukup beragam. Pola ini kemudian dapat di amati dengan lebih detail ketika sudah dikelompokkan berdasarkansatuan geologinya dengan menggunakan diagram Schoeller yang menunjukkan bahwa adanya perbedaan rentang konsentrasi tiap-tiap ion mayor penyusun air tanah. Secara umum kualitas air tanah pada kawasan penelitian masih termasuk kategori aman menurut drinking water standard dari WHO. Sumber pencemar air tanah pada kawasan initeridentifikasi berasal dari limbah dan pupuk pertanian berdasarkan grafik perbandingan Cl (mmol) dan NO3:Cl (molar ratio). Model konseptual hidrogeologi menjawab perubahan kandungan kimia air tanah ketika air mengalir di bawah permukaan, dimana terjadi evolusi kandungan kimia air tanah pada zona hulu dan hilir. Semakin lama air mengalir di bawah tanah dan semakin jauh alirannya telah membedakan untuk perubahankimia air tanah dikawasan penelitian yang dibuktikan dengan perubahan fasies air tanah. Penelitian berhasil memberikan gambaran awal terkait kualitas air tanah sehingga dapat digunakan sebagai landasan dalam konservasi air tanah yang berkelanjutan.

Kata kunci: Air Tanah, Cangkringan, Fasies air tanah, Geokimia, Pencemaran nitrat

ABSTRACT

Groundwater is a valuable source of water for people in Cangkringan District to meet their daily needs. The interactions between groundwater and minerals that make up the aquifer, as well as anthropogenic activities, have a major influence on the chemistry of groundwater. This study aims to determine the hydrochemical characteristics of groundwater and groundwater quality and determine hydraulic connectivity to obtain a conceptual model of the aquifer in the study area. The research was carried out in several stages: general hydrogeological observations, determination of sampling points, groundwater sampling, and laboratory analysis. Based on the results of the laboratory analysis, the major ion content of groundwater in the Cangkringan area followed the sequence Na;Ca;K;Mg and HCO3;SO4;Cl;NO3. There are four main groundwater facies based on the Piper diagram: alkaline bicarbonate, alkali chloride, calcium magnesium bicarbonate, and calcium magnesium chloride. Based on Kurlov's classification, there were three classes Na+K;Mg;Ca with HCO3;SO4;Cl, Na+K;Mg;Ca with HCO3;Cl;SO4 and Na+K;Ca;Mg with HCO3;SO4;Cl. The groundwater in the study area showed a fairlydiverse pattern. This pattern can then be observed in more detail when it has been groupedbased on the geological unit using the Schoeller diagram, which shows that there are differences in the concentration ranges of each major ion making up the groundwater. Ingeneral, the quality of groundwater in the research area is still in the safe category according to the WHO drinking water standard. Groundwater pollutant sources in this area were identified as originating from agricultural waste and fertilizers based on Cl (mmol) and NO3:Cl (molar ratio) comparison charts. The hydrogeological conceptual model addresses changes in the chemical content of groundwater when water flows belowthe surface, where there is an evolution of the chemical content of groundwater in the upstream and downstream zones. The longer the water flows underground and the fartherit flows, the more different it is for changes in the chemistry of groundwater in the researcharea, as evidenced by the changes in groundwater facies. The research succeeded in providing an initial picture regarding groundwater quality so that it can be used as a basisfor sustainable groundwater conservation.

Keywords: Groundwater, Cangkringan, Groundwater Facies, Geochemistry, Nitrate Pollution