



INTISARI

Kota Makassar, yang terletak di tepi Selat Makassar, merupakan kota terbesar di Kawasan Timur Indonesia dengan perkembangan pembangunan dan pertumbuhan penduduk yang pesat. Kebutuhan air bersih pada 2017 mencapai 112,9 juta m³, sedangkan ketersediaan air PDAM hanya 47,3 juta m³, sehingga terjadi defisit sebesar 65,6 juta m³ yang dipenuhi masyarakat melalui air tanah. Kurangnya kontrol dalam pengelolaan air tanah dapat menimbulkan masalah seperti intrusi air laut pada akuifer pesisir, seperti dilaporkan terjadi di Makassar. Penelitian ini bertujuan untuk mengetahui kondisi geologi dan hidrogeologi, tipe air berdasarkan geokimia dan isotop, serta sebaran kejadian intrusi air laut di wilayah pesisir Kota Makassar. Tahapan penelitian yang dilakukan meliputi observasi geologi dan hidrogeologi, analisis geokimia dan isotop, serta analisis kejadian intrusi air laut berdasarkan tinjauan kondisi geologi, hidrogeologi, geokimia, isotop, penggunaan air tanah, daerah imbuhan air tanah dan penelitian terdahulu. Hasil penelitian menunjukkan kondisi geologi daerah penelitian tersusun atas endapan pasir, pasir lempungan, lempung pasiran, batupasir, batupasir tufaan, dan batulempung, sehingga kondisi hidrogeologi setidaknya terdiri dari akuifer bebas, akuitar, akuifer semibebas, dan akuiklud, dengan ketebalan dan konduktivitas hidrolika bervariasi. Pola dan arah aliran air tanah di akuifer bebas mengalir dari timur ke barat menuju Selat Makassar. Tipe air tanah yang ditemukan berdasarkan analisis TDS, DHL, geokimia, dan isotop meliputi air tawar dan payau pada sumur dangkal dan sumur bor dalam. Air payau pada sumur dangkal ditemukan di Kecamatan Tallo, Mariso, dan Manggala, sedangkan pada sumur bor dalam ditemukan di Kecamatan Ujungpandang. Analisis kejadian intrusi air laut menunjukkan bahwa intrusi air laut hanya terjadi pada sumur dangkal di Kecamatan Tallo. Air payau pada sumur dangkal di Kecamatan Manggala disebabkan karena merupakan air formasi (*brine basin*), sedangkan air payau pada sumur dangkal di Kecamatan Mariso dan sumur bor dalam di Kecamatan Ujungpandang disebabkan pengaruh kontaminasi antropogenik dari aktivitas manusia berdasarkan tinjauan Grafik Cl/Br dan Cl.

Kata kunci: Intrusi Air Laut, Geokimia, Isotop, Imbuhan Air Tanah, Makassar



ABSTRACT

Makassar, located on the edge of the Makassar Strait, is the largest city in Eastern Indonesia and has experienced rapid development and population growth. In 2017, the demand for clean water reached 112.9 million m³, while the PDAM water supply was only 47.3 million m³, resulting in a deficit of 65.6 million m³, most of which was met by the community through groundwater. The lack of proper management and control over groundwater utilization can lead to problems such as seawater intrusion into coastal aquifers, as reported in several locations in Makassar. This study aims to investigate the geological and hydrogeological conditions, identify the types of groundwater based on geochemistry and isotopes, and map the distribution of seawater intrusion in the Makassar coastal area. The research process includes geological and hydrogeological observations, geochemical and isotope analyses, and the analysis of seawater intrusion based on geological and hydrogeological conditions, geochemical and isotope data, groundwater usage, groundwater recharge areas, and previous studies. The results of the study indicate that the geological conditions in the study area consist of sand, sandy clay, clayey sand, sandstone, tuffaceous sandstone, and claystone. Consequently, the hydrogeological conditions consist of unconfined aquifers, aquitards, semi-unconfined aquifers, and aquicludes, with varying thicknesses and hydraulic conductivities. The pattern and direction of groundwater flow in the unconfined aquifer move from east to west toward the Makassar Strait. Groundwater types, based on TDS, EC, geochemistry, and isotopes, include fresh and brackish water in the shallow and deep bored wells. Brackish water in the shallow wells was found in the districts of Tallo, Mariso, and Manggala, while in the deep bored wells, it was found in the Ujungpandang district. Seawater intrusion analysis shows that seawater intrusion only occurs in the shallow well in Tallo. The brackish water in the shallow well in Manggala is caused by the brine basin, while the brackish water in the shallow well in Mariso and deep bored wells in Ujungpandang is due to the anthropogenic contamination from human activity, as indicated by the Cl/Br and Cl graphical analysis.

Keywords: Seawater Intrusion, Geochemistry, Isotopes, Groundwater Recharge, Makassar