

SARI

Airtanah merupakan sumber utama bagi masyarakat sehingga kualitasnya perlu dijaga dari potensi pencemaran, salah satunya dari aktivitas Tempat Pengolahan Sampah Terpadu (TPST). Penelitian ini bertujuan menilai tingkat kerentanan airtanah di sekitar TPST Tamanmartani, Sleman, menggunakan metode GOD (Groundwater confinement, Overlaying strata, Depth to groundwater table) berbasis Sistem Informasi Geografis (SIG). Data yang digunakan meliputi kondisi litologi, kedalaman muka airtanah, serta hasil analisis kimia airtanah, khususnya kandungan nitrat. Hasil menunjukkan bahwa daerah penelitian didominasi akuifer bebas dengan litologi pasir vulkanik, breksi, dan endapan aluvial. Kedalaman muka airtanah yang relatif dangkal (<15 m) serta temuan kadar nitrat pada airtanah yang melebihi baku mutu memperkuat indikasi tingginya kerentanan terhadap pencemaran. Peta indeks GOD memperlihatkan bahwa sebagian besar wilayah sekitar TPST berada pada kelas kerentanan tinggi hingga sangat tinggi. Dengan demikian, lokasi TPST Tamanmartani dinilai tidak sesuai standar penentuan lokasi TPST (SNI 03-3241-1997) karena berpotensi mengancam kualitas airtanah. Oleh karena itu, pengelolaan dan mitigasi kejadian pencemaran airtanah di TPST Tamanmartani perlu diperhatikan. Penelitian ini menegaskan pentingnya pertimbangan aspek hidrogeologi dalam perencanaan dan pengelolaan fasilitas pengolahan sampah.

Kata kunci: airtanah, kerentanan, TPST, metode GOD

ABSTRACT

Groundwater serves as the primary water source for local communities; therefore, its quality must be safeguarded against potential contamination, particularly from activities associated with Integrated Waste Processing Sites (TPST). This study aims to evaluate the level of groundwater vulnerability in the vicinity of the Tamanmartani TPST, Sleman, using the GOD method (Groundwater confinement, Overlaying strata, and Depth to groundwater table) integrated with Geographic Information System (GIS) analysis. The data utilized include lithological characteristics, groundwater table depth, and groundwater chemical analysis, specifically nitrate concentration. The results indicate that the study area is predominantly composed of unconfined aquifers consisting of volcanic sand, breccia, and alluvial deposits. The relatively shallow groundwater table (<15 m) and nitrate concentrations exceeding the permissible limits reinforce the indication of high susceptibility to contamination. The GOD index map demonstrates that most areas surrounding the TPST fall within high to very high vulnerability classes. Consequently, the Tamanmartani TPST location is deemed inconsistent with the site selection criteria for TPST (SNI 03-3241-1997), as it poses a potential threat to groundwater quality. Therefore, groundwater pollution management and mitigation measures at the Tamanmartani TPST require serious attention. This study underscores the importance of incorporating hydrogeological considerations in the planning and management of waste processing facilities.

Keywords: *groundwater, vulnerability, TPST, GOD method*