

ANALISIS KONSENTRASI DAN DISPERSI NITROGEN DIOKSIDA DAN KARBON MONOKSIDA DI SEKITAR TERMINAL BUS GIWANGAN

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INTISARI

Analisis konsentrasi gas polutan di udara sangat diperlukan karena adanya peningkatan jumlah kendaraan bermotor, khususnya di wilayah terminal bus. Tujuan dari penelitian ini adalah mendapatkan model pola dispersi dan konsentrasi polutan NO₂ dan CO di sekitar Terminal Giwangan yang dihasilkan menggunakan perangkat lunak AERMOD, mengetahui dampak peningkatan jumlah kendaraan terhadap konsentrasi polutan NO₂ dan CO di sekitar Terminal Giwangan, serta mengetahui dampak pencemaran NO₂ dan CO terhadap lingkungan dan kesehatan penduduk di sekitar Terminal Giwangan.

Penelitian dilakukan dengan pengumpulan serta pengolahan data iklim, topografi, dan laju emisi kendaraan dilanjutkan dengan pengujian konsentrasi NO₂ dan CO di lapangan. Langkah selanjutnya yang dilakukan yaitu pemodelan pola dispersi polutan dengan menggunakan AERMOD dilanjutkan dengan validasi model serta analisis pola dispersi dengan skenario peningkatan jumlah kendaraan 10 tahun mendatang serta saat libur natal dan tahun 2024 dan kualitas mesin kendaraan dengan standar Euro. Analisis dampak dilakukan dari segi dampak kesehatan, dampak lingkungan, dan Indeks Standar Pencemar Udara (ISPU).

Hasil penelitian menunjukkan bahwa konsentrasi kedua polutan di seluruh titik pengambilan sampel di bawah baku mutu sehingga kualitas udara dalam kondisi baik dengan status warna menurut ISPU adalah hijau. Dalam hal ini, konsentrasi tertinggi berada di dalam terminal untuk polutan NO₂ dan di sebelah selatan terminal untuk polutan CO. Di samping itu, dampak lingkungan terbesar yang disebabkan oleh emisi kendaraan adalah pemanasan global serta tidak ditemukan potensi efek non karsinogenik terhadap kesehatan penduduk yang tinggal di sekitar terminal selama 30 tahun mendatang.

Kata kunci: AERMOD, dispersi, konsentrasi, polutan, terminal giwangan

ANALYSIS OF THE CONCENTRATION AND DISPERSION OF NITROGEN DIOXIDE AND CARBON MONOXIDE AROUND THE GIWANGAN BUS STATION

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ABSTRACT

Analysis of the concentration of pollutant gases in the air necessary due to the increasing number of motorized vehicles, especially in the bus station area. This research is aimed to is to obtain a model of the dispersion patterns and concentrations of NO₂ and CO pollutants around Giwangan Terminal using AERMOD software, to determine the impact of increasing the number of vehicles on the concentration of NO₂ and CO pollutants around Giwangan bus station, and to determine the impact of NO₂ and CO pollution on the environment and population health around Giwangan bus station.

The research was carried out by collecting and processing climate data, topography, and vehicle emission rates data followed by collecting the sample of NO₂ and CO concentrations in the field. The next step was to simulate the pollutant dispersion pattern using AERMOD followed by model validation and analysis of the dispersion pattern with a scenario of increasing the number of vehicles in the next 10 years and during the Christmas and New Year holidays in 2024 and the quality of vehicle engines using Euro standards. The impact analysis was carried out in terms of health impacts, environmental impacts, and the Air Quality Index (ISPU).

The results showed that the concentrations of the two pollutants at all sampling points were below the quality standards so the air quality was in good condition with the color status according to the ISPU being green. In this case, the highest concentrations were inside the terminal for NO₂ pollutant and to the south of the terminal for CO pollutant. In addition, the biggest environmental impact caused by vehicle emissions was global warming and there was no potential non-carcinogenic effect on the health of residents living around the terminal for the next 30 years.

Keywords: AERMOD, concentration, dispersion, giwangan bus station, pollutant