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PRELIMINARY IMPACT ASSESSMENT OF NO₂ EMISSION FROM A HEATING PLANT ON AIR POLLUTION: CASE OF ZEMUN, SERBIA

Boban Pavlović*, Uroš Pantelić, Marija Živković, Dejan Ivezić

University of Belgrade, Faculty of Mining and Geology, Djusina 7, 11120 Belgrade, Serbia

Abstract

The aim of this paper is to provide a preliminary evaluation of the impact caused by NO₂ emissions from a heating plant on the local air quality. To model the spatial distribution of NO₂ emissions from the heating plant, the AERMOD model was employed. The evaluation was conducted by analyzing and contrasting the simulated NO₂ concentration from the heating plant with the overall NO₂ concentration recorded at the nearest monitoring station over the entire heating season. The study focused on the Zemun heating plant situated in the Zemun municipality of Belgrade. Operating at full capacity and running continuously for 24 hours, the heating plant's maximum 24-hour average modeled NO₂ concentration was roughly 10% of the total NO₂ concentration measured at Zemun's air monitoring station. This finding suggests that the heating plant does not constitute the primary source of NO₂ pollution in the vicinity. In order to gauge the responsiveness of the proposed method for initial impact assessment, the model also simulated variations in meteorological and emission factors for the five highest 24-hour concentrations originating from the heating plant. The sensitivity analysis uncovered that reduced wind speed could result in a 60% upsurge in NO₂ concentrations, and a reduction in NO₂ emissions could bring about a 50% decrease in concentrations originating from the heating plant.

Key words: AERMOD, air quality, dispersion modeling, heating plant, NO₂ pollution

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* Author to whom all correspondence should be addressed: e-mail: boban.pavlovic@rgf.bg.ac.rs