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Characterization of air quality in the surrounding environment due to the emissions of TEKO Kostolac Power Plants, Serbia



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Introduction

For the past 50 years, air pollution was a widely recognized problem that comes with long and short term impact on human health and the environment. With high rate of urbanization, industrialization and increase in motorized transport from the rapid population growth has resulted in increased concentration of various air pollutants: nitrogen oxides, sulfur oxides, carbon monoxide, carbon dioxides, ozone, VOCs, unburned hydrocarbons, particulate matters, heavy metals. Combustion of fossil fuels is the main contributor to the air pollution. The main sources of air pollution in the region of Kostolac in Serbia are thermal power plants Kostolac A and Kostolac B, erosion from mining zones, dust scattering during coal unloading and spontaneous combustion of outdoor coal storage yard.



The aim of this paper is to determine the impact of Power Plants and Mines Kostolac, (TE-KO) on the quality of ambient air in the surrounding environment. The pollutants (SO_2 , NO_2 , VOCs, soot, Pb, Cd, Zn) were monitored from five monitoring stations from different distance surrounding the plant, from November 9, 2017 until December 28, 2017.

A multivariate technique (Principal Component Analysis) has been applied to a set of data in order to determine the contribution of different sources. Compared with the Regulation on conditions for monitoring and air quality requirements ("Official Gazette of RS") introduced by the Government of the Republic of Serbia the variables soot, metals such as Pb, Cd, and Zn were slightly higher than the maximum the permissible levels. The air pollutants concentrations were found higher in the Stations 1 and 2 nearest power plant. The results showed that air quality parameters at other locations in around industrial area were in a good category based on the Serbian regulations. It was found that the main principal components, extracted from the air pollution data, were related to traffic activities and coal combustion. These results provide information to be used for developing better pollution control strategies for the air near Kostolac Basin, Serbia.

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