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M.Sc. ENVIRONMENTAL ENGINEERING**

**IDENTIFICATION OF PER- AND POLYFLUOROALKYL
SUBSTANCES (PFAS) IN THE SURFACE WATERS OF THE
DANUBE RIVER NEAR BUDAPEST USING QGIS AND LC-MS
METHODS**

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Summary

Per and polyfluoroalkyl substances (PFAS) pose significant environmental and public health concerns worldwide due to their ubiquitous presence and persistence. In this context, the identification of possible PFAS contamination spots in surface waters represents a relevant theme of research, since surface waters, especially rivers, work as a vital resource for human consumption, agriculture, industry, and ecosystem management particularly in Hungary. Considering this, the primary objective of this study is to investigate the presence and distribution of PFAS in the surface waters of the Danube River near Budapest, Hungary. To achieve this goal, sampling and LC-MS analysis of water from six locations along the river were performed to identify possible spots of PFAS contamination. Also, maps were generated using QGIS software (3.28.12-1 version), where an IDW interpolation was performed to visualize the estimated impact of PFAS in the surroundings, according to the samples. Special emphasis was placed on understanding the sources and potential ecological impacts of PFAS contamination, with a focus on urban, industrial, and agricultural inputs. Through analysis of the content of the maps generated using qGIS software, it was possible to identify that the points located near Szentendre had the highest concentrations for PFAS in general, while the points located in the South, such as Ercsi, Ráckeve and Tököl had the lowest. Thus, the results of this work provide an easy way to visualize the actual state of PFAS contamination in the Danube River near Budapest, in order to supply and contribute to the development of strategies for mitigating the impact of PFAS pollution in the area, with the future goal of preserving the water quality in the Danube and contributing to the development of a sustainable approach for protecting water resources and human health.

Keywords: PFAS, Danube River, Hungary, LC-MS/MS, qGIS, Water Quality Management, Water Pollution.