

The amount of municipal waste generated, including the amount of collected waste in the form of mixed waste containing a high proportion of organic fraction, is one of the main reasons for the occurrence of olfactory nuisances in the broadly understood waste management. Waste management itself is a continuous and multi-stage process, during which significant amounts of odorous substances can be released. Among the stages of waste management that may cause olfactory nuisances, we can distinguish, among others, their collection, transport, transshipment at transfer stations, or processing in mechanical-biological waste treatment plants, in thermal waste treatment plants or at waste landfills. Mechanical-biological waste treatment plants are a particular place where there is a high intensification of various processes that can emit odors into the environment. Monitoring of odor emission sources is a difficult and time-consuming process, but extremely necessary as indicated by, among others, the *Best Available Techniques conclusions for waste treatment*. They indicate the necessity to implement odor management plans, which include programs for identifying odor sources and aimed at determining their variability. The selection of an appropriate method is a key task.

In the study, characteristics of 5 selected odor monitoring strategies in the context of their applicability in odor management plans. The aim of the study was, among others: to determine the usefulness of selected odor monitoring strategies for short- and long-term purposes; to determine the variability of emissions from selected processes and installations located on the premises of the studied facilities; to conduct an analysis of the influence of basic waste parameters and meteorological conditions on selected odor emission sources; to determine influence of the variability of odor emissions from selected processes on the range of odor impact of the selected waste management plant.

To carry out the research, 5 odor monitoring strategies were selected, including measurements using field olfactometry and dynamic olfactometry, parametric measurements using odor intensity, measurements of volatile organic compounds, and two computational methods, i.e. the inverse distance weighted interpolation method, and the CALMET/CALPUFF system. A series of measurements were conducted in 2021/2022 at 3 selected mechanical-biological municipal waste treatment plants.

Based on the conducted research, the usefulness of each of the applied measurement and computational techniques in odor monitoring was assessed. By using measurements with field olfactometry, odor intensity measurements, and measurements of volatile organic compounds, it is possible to estimate the variability of odor emissions in the studied sources and to

indicate the most problematic areas in terms of odor emissions and odor-producing substances within the selected facilities. The utilized method of spatial data interpolation allows for obtaining correct, albeit with some statistical error, concentration distributions, which can also be used to determine the most odorogenic areas and describe the spatial variability of odors. The applied CALMET/CALPUFF system, combined with properly selected emission factors and defined odor emission variability, allowed for obtaining the potential range of impact of the studied facility. The results indicate a significant influence of the detail of the considered variability of odor emissions on their dispersion with the use of CALMET/CALPUFF system. The applied research methods can be used to draw about the variability of odor emissions, these methods can be an integral part of odor management plans in accordance with Best Available Techniques.