Odour emission factors for the key sources in Estonia

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People are often simultaneously subjected to a range of multiple environmental stressors, including odours (Pedersen, 2015). Odour annoyances are important considerations in research on health effects of air pollution and in addition to that social conflicts caused by odour annoyance are increasingly becoming a reality in the urban centres (Van Harreveld, 2015). Therefore it is crucial to estimate the odour emission rates (OER) for the key emission sources. In total 260 odour emission samples from 9 sectors (agriculture, glass fibre production, animal waste management, waste water treatment, waste management, pulp and paper mills, oil shale industry, iron casting and fuel storages) were collected and analysed. Odour emission measurements were conducted using direct emission sampling from the emission source, according to the standard EVS-EN 13725 "Air quality – Determination of odour concentration by dynamic olfactometry". Odour samples were collected to Nalophan^{TM} sampling bag using a SKC Vac-U-Chamber. At some sources (high concentrations, high humidity and/or high temperature) the predilution (Dekati® DI-1000, 8-64x predilution and EPD, 10-100x predilution) with the N2 of odour samples was used. All odour samples were analysed within 24 h in laboratory using olfactometer TO-8. At point sources the odour samples were collected directly from the emission gases and additionally gas velocity, temperature and dynamic pressure was measured. Samples from the area sources were collected using wind tunnel (V_m = 0.03 m^3/s), where the inlet air was drawn through activated carbon filter. For the OER validation the odour emission database was created and Austal2000G was used for the dispersion calculations. In some areas grid field inspections within 12 months according to the EVS 888 (transposed from VDI 3940) were carried out. In 2 areas questionnaires according to the EVS 887-1 (transposed from VDI 3883-1) were performed. In general OER were in good agreement with the field inspection results.