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The municipal solid waste landfill as a source of ozone-depleting substances in the United States and United Kingdom

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Abstract. This study provides observation-based national estimates of CFC-11, CFC-12, CFC-113, and 1,1,1-trichloroethane emissions for the United States (US) and United Kingdom (UK) from municipal solid waste (MSW) landfills. The scarcity of national estimates has led to the assumption that a significant fraction of the lingering ozone-depleting substance (ODS) emissions, which have been detected in industrialized countries, could be emitted from landfills. Spatial coverage was achieved through sampling at seven landfills in Massachusetts and through data provided by nine UK landfills. Linear least square regressions of recovered ODS vs. CH₄ were used in combination with national estimates of landfill CH₄ emissions to estimate 2006 national US and UK ODS landfill emissions. The ODS landfill emission estimates were then compared to recent estimates of total US and UK ODS emissions. US ODS landfill emissions are 0.4%–1% (0.006–0.09 Gg/year) of total US emissions. UK ODS landfill emission estimates are 1% (0.008 Gg/year) and 6% (0.03 Gg/year) of total UK CFC-11 and CFC-12 emissions, respectively. This indicates that landfills are only a minor source of lingering ODS emissions in the US, but may be more significant for CFC-12 emissions in the UK. The implication is that the majority of current ODS emissions in industrialized countries is likely coming from equipment still in use.

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