

Interactive comment on “The municipal solid waste landfill as a source of ozone-depleting substances in the United States and United Kingdom” by E. L. Hodson et al.

Anonymous Referee #1

Received and published: 3 November 2009

General comments.

The authors present measurements from several landfills in the US and the UK and use them to estimate the contribution of landfills to ongoing emissions of ozone-depleting gases (CFC-11, CFC-12, methylchloroform, CFC-113) for the two countries. The topic is important, the data novel and useful, and the science robust. The work is relevant to ACP and should be published. I have only minor comments and suggestions.

Specific comments.

- You look only at MSW landfills. Somewhere, please discuss to what extent non-MSW landfills are likely to have different ODS emissions. And if this has any potential to
C6636

affect your conclusions. Perhaps using LandGEM?

- What about other ODSs? Are landfills likely to be more important for those or not? Some mention of this in the conclusions would be useful.

- According to Fig 1, the closed landfills generally have lower ODS emissions. You exclude them in the regression. Doesn't this mean that the resulting emission numbers are high estimates for landfill ODS emissions? This would bolster your overall argument that landfills are not an important ODS source for the US or UK. Some brief discussion seems needed.

- somewhere, clarify what is meant by "recovered" and that recovered gas is generally not emitted.

- 22805, L21. Please clarify what is meant by the 5 years (must be the increase, not the total recovery time) or else just delete the "(5 years)"

- 22807, L16, how large a "majority"? 51%? 99%?

- 22808, L19-21. This is awkward. By "intra-landfill" do you mean different locations across the landfill? Different times at the same location? Please clarify your wording. Any ideas about why CFC-11 is so variable? Related possibly to the high rates of degradation you mention later?

- 22810, L5-6. Citing a PhD thesis is not the best since it can be very difficult to access at times. This one is posted online but it's not clear how stable that is, and whether it will be there a year from now. I strongly suggest extracting the relevant experimental details from the thesis and adding them to the Supplemental Information.

- 22812, L16-17. You're also assuming that the national CH₄ emission numbers are good. This should be mentioned.

- 22813, L3-4. This argument also implies that CFC-11 degrades faster than CH₄, not only faster than the other ODSs. In fact one of the Scheutz papers shows just that.

- Table 1. Please use "ND" or something for undetectable instead of leaving the line blank. Otherwise the casual reader thinks there's no data.

- Table 5 (and throughout text). Excess precision. E.g., instead of "0.44 (0.17-0.79)" I recommend "0.4 (0.2-0.8)".

Technical comments.

- Abstract, "US ODS landfill emissions ARE", "UK ODS landfill emissions ARE"

- Abstract, "The IMPLICATION IS ... IS likely coming from equipment still in use"

- 22805, L2, suggest "The four ODSs CONSIDERED in this study"

- 22805, L3, should be 1,1,2-trichloro-1,2,2-trifluoroethane

- 22805, L4, suggest "combination of HIGH ozone depleting potential (ODP), the LARGE volume"

- 22805, L7-8, suggest "of THE Montreal Protocol GASES"

- 22805, L13, suggest "EXERTING ~5000-15000 times"

- 22805, L27, "blown foam" or "foams" instead of "foam blowing" ?

- 22809, L17, clarify what is meant by "static fixed loop injection"

- 22809, L26, suggest "accuracy of BETTER THAN 5%"

- 22812, L21, suggest "compared the LandGEM emission ratios and the RECOVERY SYSTEM ratios MEASURED DURING this study" or something similar

- 22814, L6-7. Confusing. Should this be "2) that the UK waste has more total CFC-12 landfilled mass"?

- 22815, L2, "The best estimates USE"

- 22815, L11, "for UK TOTAL CFC landfill emissions" ??

C6638

- 22817, L15, "the national CH4 EMISSION value"

- 22817, L21, "MPG" not used or defined previously. Stick with ODS or use an actual word such as "compound".

- 22818, L10-13. Awkward, rephrase.

- References. Many references have an extra number after the year.

- Figures 1 & 2. Please mention in the caption the differing ordinate scales between the panels.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 22803, 2009.

C6639