

Atmos. Chem. Phys. Discuss., author comment AC1  
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## Reply on RC1

Ashu Dastoor et al.

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Author comment on "Impact of Athabasca oil sands operations on mercury levels in air and deposition" by Ashu Dastoor et al., Atmos. Chem. Phys. Discuss.,  
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We thank the reviewer for the positive and constructive comments on our paper. We have shortened the abstract in the revised manuscript as suggested. Our responses to the reviewer's comments in italic.

Specific comments:

Line 318: Possibility

*Corrected*

Line 341: (all in kg yr<sup>-1</sup>)

*Corrected*

Lines 423-425: Higher GEM oxidation rate in summer and the resulting maximum of Hg wet deposition in summer is probably the more important process.

*Our model sensitivity analysis to various Hg processes shows that oxidation has comparatively small impact on the seasonal cycle of GEM. GEM bi-directional surface fluxes have a much larger impact on shaping the GEM seasonal cycle (see Zhou et al. 2021), except in regions of high oxidation rates such as the Arctic in springtime. We have added citation to Zhou et al. 2021 in the revised manuscript.*

*Zhou, J., Obrist, D., Dastoor, A., Jiskra, M. & Ryjkov, A. Vegetation uptake of mercury and impacts on global cycling. Nat. Rev. Earth Environ. 2, 269-284 (2021).*

Line 454: "pet coke piles"?

*This expression is correct.*

Line 887: "emissions"

*Corrected*