

## ***Interactive comment on “Assessment of excess N<sub>2</sub> and groundwater N<sub>2</sub>O emission factors of nitrate-contaminated aquifers in northern Germany” by D. Weymann et al.***

### **Anonymous Referee #1**

Received and published: 20 May 2008

### GENERAL COMMENTS

The manuscript by Weymann et al. evaluated denitrification process and N<sub>2</sub>O accumulation at the different aquifers. The authors also provided important insights on improvement of the estimation of indirect N<sub>2</sub>O emission factor from aquifer. However, I could not understand well on the difference of denitrification potential and process between the 4 aquifers. This problem might be related to lack of information on the study aquifers like as geology, groundwater residence time, groundwater chemistry etc... The discussion sometimes contains rather unexpected remarks. I would request some revisions and additions coupled with the following comments.

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## SPECIFIC COMMENTS

Page 1268, line 3: What is the meaning of the additional samples? Is it no matter to do sampling from the tap?

Page 1270, line 4: Misspelled word (Boehlke = Böhlke)

Page 1276, lines 18-26: The authors need to show the data of hydrostatic pressure or hydraulic potential of the shallow and deep groundwater.

Page 1278, lines 6-7: It would be better to provide the information of groundwater residence time at the study aquifers.

Page 1278, lines 21-25: I would expect that also the organic carbon content effects on the N<sub>2</sub>O emission from the aquifer.

Table 1: The authors need to show more detailed information about the each study aquifers like as geology, material components, hydraulic conductivity, hydraulic potential of groundwater etc... It would be better to show the pH and DO with the each sampling depth (not overall). The authors have not stated clearly about the reason why pH and DO varies between the 4 aquifers. I would believe that it would relate to the difference of material components of the aquifers. Especially, the content of electron donor such as organic carbon and sulfides is important for the evaluation of denitrification potential.

Table 2: Same as Table 1, it would be better to show the concentrations of excess N<sub>2</sub>, N<sub>2</sub>O, NO<sub>3</sub><sup>-</sup>, NO<sub>3</sub>(t<sub>0</sub>)- and RP with the each sampling depth.

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Interactive comment on Biogeosciences Discuss., 5, 1263, 2008.

**BGD**

5, S606–S607, 2008

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