

The authors have done a good job responding to my comments and this manuscript is almost ready for publication. I only have a couple of minor things.

Regarding their response to my comment about Page 7260 Line 11. In their response the section starting with "In older studies....." and ending with .....a bit problematic.", this is an interesting point and perhaps should be mentioned in the text.

Regarding their response to my comment about Page 7265 Line 20-22. The word "huge" seems a little exaggerated to me. I would say "large" or "significant" or something like that. To me, to be huge it would have to be something like the sulfate background of 25,000  $\mu\text{M}$ .

Regarding their response to my comment on Page 7275 Line 16-18. I think this is a semantic problem. Definition of dominate: "to rule over, control, or govern; in mathematics, to have terms or components greater in absolute value than the corresponding terms or components of a given series" There is less  $\text{NO}_2$  oxidation than  $\text{NO}_2$  reduction, i.e., the  $\text{NO}_2$  oxidation rate is less than the reduction rate. How can the smaller rate dominate. I suggest they reword this to say something straightforward like the " $\text{NO}_2$  oxidation is clearly a major pathway because the most of the nitrate reduced is reoxidized".

Regarding their response to my comment about Page 7276 Line 13-15. They say "we discuss this point on Page 7277, Lines 8 to 10." The explanation on page 7277 is very brief and basically says the discrepancy is due to anammox. If anammox is the explanation, what are the implications? How much OM has to be oxidized to produce the needed  $\text{NH}_4$  (or is there another source)? How is the OM oxidized? How is the overall epsilon value affected potential anammox isotopic fractionations?