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Drinking Water Engineering and Science Discussions

Interactive comment on "Effect of biostimulation on biodegradation of dissolved organic carbon in biological granular activated carbon filters" *by* K. Tihomirova et al.

Anonymous Referee #2

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The authors discuss a method for enhancing biodegradation in biofiltration processes in drinking water treatment by the addition of labile organic carbon (LOC) in the form of either acetate standard solution or Luria Bertani solution. They conclude that, on addition of these biostimulants, the biodegradation rate increases by 12 times. The work is interesting and of relevance in a drinking water context when downstream bacterial regrowth or biofouling is of concern. The manuscript is relatively short and expansion is required in key areas to fully explain the work.

Specific Comments. The authors could improve the manuscript by describing the water sampling procedure in the methods section in more detail (section 2.4). The sampling

procedure is described in part at the beginning of the Discussion section but this should be brought to Section 2.4 and elaborated upon. For example, it is not clear whether one or more water samples were utilised. At line 11, page 72, a water sample is referred to in the singular, but earlier it is referred to as plural (line 17, page 70). If more than one sample was collected, what was the frequency of the sampling and over what period of time? Were different water samples used for each experiment (e.g. for those with added LOC and for those without) and if so did the raw water quality (in terms of DOC and BDOC) differ? If only one sample was used, what is the limitation of this? Were experiments repeated and, if not, can the authors comment on the reproducibility of the work?

In the Discussion section at lines 272 and 4 or page 74, the average DOC of both the raw water and of the water post-BAC and the BDOC of the BAC effluent is reported with the error. What does this error represent? It seems relatively large and therefore could impact the results. This should be explained in the manuscript prior to the Discussion section.

Could the authors explain their rationale for sampling post-BAC rather than pre-BAC? How efficient were the full scale BAC filters at biodegrading DOC? If they were operating efficiently, biodegradable DOC could have been significantly decreased upstream of the sampling point, explaining why the BDOC of the water sample was only 7% (as stated on line 11, page 72).

Finally, at line 17, page 74, the authors indicate that by over-feeding the filter the biodegradation rate constant decreases and bacterial release into effluent occurs. Can the authors discuss the ramifications of this if it were to happen in a drinking water treatment plant? How would the optimal concentration of LOC be maintained?

Interactive comment on Drink. Water Eng. Sci. Discuss., 5, 67, 2012.