REFEREE COMMENT

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Title: **"Use of an external organic carbon source in the removal of nitrates in Bio-sand filters (BSF)"**

Authors: **Crispen Mutsvangwa and Evans Matope**

In order to find efficient and low cost external carbon source for denitrification bacteria, this paper evaluates the use of the ethanol at C/N ratios of 1.1 and 1.8. The experiments were carried out in biofilters with sand fulfillment.

GENERAL COMMENTS

1. It is well known that the rate of denitrification process depends, inter alia, on the type and concentration of organic carbon present in water. Literature review should be more comprehensive.

2. Why do the authors focus only on measuring nitrates in the effluent? The denitrification process takes place in several stages and can stop at the formation of nitrites or other toxic by-products. Nitrites can be easily measured using conventional methods or Spectroquant Photometrical Tests.

3. Excessive amount of C relative to N can facilitate the reduction of sulfate to sulfide, a highly toxic product for fish. Have the authors considered the impact study of sulphates on the denitrification process?

4. During only 46 days of experiment with external source of carbon the flow rate decreased by 75%. The increase of microorganism biomass caused the filter clogging, so it is reason that more common is using of fluidized sand biofilters.

SPECIFIC COMMENTS

1. Why did the authors study at an influent nitrate concentration of 25 mg/l, if the acceptable value is 11 mg N-NO_3^-/ l (48.7 mg NO_3^-) [South African National Standard, Drinking Water 2015].

2. How can the authors explain such a high oxygen content in influent at 8.2 mg/l?

3. The authors noted a slight decrease in pH from 8.6 to 6.8. But the properly conducted denitrification process causes an increase in pH.

TECHNICAL CORRECTIONS

1. Please mark the direction of flow in Figure 1.

2. In Table 4, after "17 Sampling interval (days)" data are repeated for C / N = 1.1 and C / N = 1.8.