

Second Revision on „Assessing the perturbations of the hydrogeological regime in sloping fens through roads” by Fabien Cochand, Daniel Käser, Philippe Grosvernier, Daniel Hunkeler, Philip Brunner

## General Comments

I appreciate the detailed response of the authors to the comments I raised in the first round of review. They addressed all points and adapted the manuscript accordingly in most places. The manuscript and figures have been improved significantly.

At some positions, the added text requires further revision. Sometimes, the authors gave explanations as response to the reviewer which should be given in the manuscript to clarify these points also for the reader who might wonder at the same aspects while reading. There are also a few remaining open questions from the first round of review. These issues are addressed in the comments below.

Although the author stated that they reworked the text (specifically in some sub-sections of 2 & 3), it appears to me that they only added few lines/words/brackets at critical points for some parts. Several paragraphs are still written in a repetitive and elongated manner which is not reader friendly. You could easily cut out redundant phrases and repetitions to increase the readability (some examples given below). The authors should consider professional language support or at least a proper proofreading and revision by a native speaker.

## Specific Comments

- Background information on the three road structures developed in Switzerland is still missing [introduction].
- Typo in l. 71-72
- Integrate your response to the text as background information on the model setup for the road types, e.g. [When a road construction takes place, impermeable material is excavated upstream and filled downstream which is represented by an increased number of inactive cells below the road.](#)  
(from answer to “The mesh modifications for cases 5d, 5e and 5f show an artificial increase of inactive cells below the road (step shape instead of continuous slope form). Shouldn’t there be soil cells below the road construction? This might significantly modify the simulation results.”) [section 2.2.2]

### Section 2.2.3:

- it is not done by just renaming the subsection title; the text should be adapted as well (e.g. the first sentence in the section still starts with “The sensitivity analysis...” )
- many newly added sentences require improvement in language (line 212-216, l. 2018-220), please perform a proper proofreading
- The authors still have a lot of redundant text which inhibits the readability:
  - Phrases like “In order to simulate each parameter combination” (l.224) could easily be cut out without any loss of information.
  - You could cut the entire sentences in l. 229-232: the method section should contain the specific information, not elaborate explanations on the motivation (which is anyway clear at that point of the paper).

### Section 3

- Figure 7:
  - First column: Head profile for the second and third site are still missing head values above and below the road which inhibits a proper picture of the hydraulics at these sites.
  - I agree with the authors that the original form of display is preferable.
- Section 3.2 could still be condensed to focus on key facts and major results.
- The discussion on gully erosion is a valuable addition. However, the text requires proper proofreading and shortening (e.g. the sentence in l. 341 is basically redundant).
- Typo in l. 322 “and”
- Figure 11: is interesting, however only for the no-road and L-drain comparison. The authors might consider different scaling to see differences also in the no-excavation and wood-log structures.
- Specific recommendations (l.335 ff) are rather part of the conclusion section.
- L 344-358 are also rather part of a summary and/or conclusion.
- I still cannot agree with the sentence “Models results have to be interpreted as an average across multiple preferential flow paths.” (l. 353-354) The simulation results in a homogeneous medium do not represent mean results of simulations in heterogeneous domains with preferential flow path! (Maybe just skip the sentence, the previous one give a proper explanation.)