

We would like to thank the anonymous referee for this review and the constructive and positive comments. We have addressed his/her comments as follows (suggested changes are highlighted):

*Comments: However, it is missing some practical examples or sufficient evidence confirming that this is an actual problem affecting the environment. It brings a novel approach, but at this stage the problem, the authors are searching solutions for, isn't supported by clear evidence.*

Response: While the manuscript included the reference to an actual example of macrofauna affecting the performance of waste rock cover facilities (Taylor et al., 2003), we recognise that this needs to be more explicit and would like to add the following sentence: “For example, in their report about the deterioration in performance of a waste rock cover facility in tropical Australia, Taylor et al. (2003) concluded that, amongst the formation of shrinkage cracks and macropores associated with root channels, the formation of termite galleries played a critical role.”

*Comment: The title contains the expression “soil macrofauna”, but the authors are only talking about ants, with termites being mentioned once but their impact is not discussed further. Earthworms should be mentioned as well, when talking about soil macrofauna, as they are burying soil macrofauna and can affect soil hydrology (Joschko et al., 1989, Joschko et al., 1992, Edwards et al. 1990, Blanchart et al., 2004), or an expression soil macroarthropods or a different formulation should be used.*

Response: We acknowledge the effect of soil macrofauna other than ants and would like to add some discussion points about earthworms as suggested by both reviewers. For example: “Likewise, burrowing macrofauna such as earthworms affect the soil structure and profile characteristics in a similar manner by modifying the pore and aggregate size distribution, the soil bulk density, and soil organic matter, eventually affecting the soil water holding capacity and infiltration rates (Blouin et al., 2013; Jouquet et al., 2014; Frouz and Kuraz, 2013).”

*Comment: Authors point out that further research on this topic is needed, which is supported by their conclusions. However, the idea of testing effect of ants and termites on soil hydrology in mesocosm experiments seems very ambitious and would also be very expensive, as both ants and termites form complicated underground galleries. The authors make this suggestion without discussing it with relevant literature that would suggest that experiments like that are viable. I would recommend to focus on field trials in post mining areas, where there are spoil heaps being colonized with soil macrofauna and this problem could occur. The hydrological and chemical parameters can be measured in field as well (e.g. Wang et al., 1995, Cammeraat et al. 2002).*

Response: We agree with the reviewer about the challenges involved with laboratory and glasshouse experiments. Likewise, we encourage field trials and promote open-cut mining lands as ideal environments. This is summarised in the manuscript at page 7, lines 16-32 and Table 3. We recognise the lack of references though and will add them as suggested by the reviewer:

“We suggest two alternative approaches to collect empirical data (Table 1) that can be used to initially quantify these interactions and eventually to reduce uncertainty in modelled hydrological variables such as deep drainage, infiltration, or plant available water (Léonard et al., 2004). For example, manipulative experiments under controlled conditions are effective means to assess the impact of early colonisers on the soil water dynamics. A soil chamber or column (Joschko et al., 1989; Joschko et al., 1992) can be used as a formicarium (Wang et al., 1995), where an ant nest is transplanted (including queen and workers) and food, water and nesting resources provided. Predefined water regimes could then be administered to simulate

rainfall events, while the temporal dynamics of soil water potential and content are monitored across the soil profile. Similarly, these small scale experiments are suitable for assessing the colonisation rates and environmental conditions (e.g., pH, temperature, humidity, soil water content) required to colonise soils by ants. At a larger investigative scale (Table 1), field trials in combination with untreated control or reference sites are effective means to assess the impact of macrofauna on soil structure and inter-specific fauna interactions (feedbacks) in relation to soil biodiversity and soil development (Cammeraat et al., 2002). In this regard, open-cut mining lands may provide ideal environments, because the physical properties of re-constructed soils are fundamentally different (and less complex) from those of degraded but physically intact soils.”

Finally, we would like to stress that, in remote areas, considerable costs are involved in field trials to cover augering and maintenance requirements. In this regard, laboratory and glasshouse experiments potentially provide a more efficient alternative to field trials and should produce critical knowledge to optimise field trial designs.

*Comment: The references are appropriate and there is a sufficient number of references. However, authors have missed some papers that bring important knowledge about the effect of soil macrofauna on soil hydrological properties.*

*Response: We thank the reviewer for providing us invaluable references and will add them accordingly.*