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Interactive comment on “Quantification of the inevitable: the influence of soil macrofauna on soil water movement in rehabilitated open-cut mine land” by S. Arnold and E. R. Williams

Anonymous Referee #2

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This review tray to bring attention to role of soil macrofauna in soil formation and soil hydraulic properties with special attention in post mining land. This is clearly important as soil fauna structures are often neglected in soil sampling to measure hydrological soil parameters as source of unwanted variability and hence neglected in hydrological modeling. However there are other similar summarizing text that should be consulted namely book chapter Frouz J Kuráž V 2014 Soil Fauna and Soil Physical Properties. in Frouz J. (ed) Soil biota and ecosystem development in post mining sites, CRC press, Boca Raton, 265-278 pp. which specifically address this issue. Secondly the text is focuses on role of ants and termites but neglect role of earthworm and other macro-

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fauna in this process which is quite fundamental also in mining soil. I realized that the proportion of individual fauna group vary in various countries and the authors are from Australia, where ants and termites play major role but e.g. termites play negligible role in most of Europe. So the authors should either made clear that this text is focused only on Australia, them more regional journal would be more appropriated or consider role of earthworms in larger extent. There are many studies available in European post mining soil to illustrate earthworm effect (here references in above mentioned review can be helpful). Finally I have some concern about organization of the article. The importance of mining and restoration is evident but the review should be about physic and biota so I would limit the note about socioeconomic impact and definitely do not put them in to name of the chapter instead I would underline advantages and limitation of post mining sites from research perspective and most importantly try to more conceptualize fauna effect. In the latter aspect I particularly missing effect of soil fauna on SOM distribution in soil profile which affect water field capacity and wilting points of post mining soil, again larger consideration of saprophagous macrofauna is highly needed. Also fauna effect will likely affect hydrology in several spatiotemporal scales, level of aggregates was already mentioned, then architecture of burrows wall and burrows itself, will be important, maintenance and development after abandonment many be another level of complexity and finally interaction of these processes on level of soil profile, those are just some key processes to consider. I believe that presentation of some schematic diagram or table that would summaries these processes and will be expanded in the text in the way what impact they may heave and how we should study them would substantially improve quality of the ms.

Interactive comment on SOIL Discuss., 2, 853, 2015.

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2, C548–C549, 2015

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