

09 January, 2016

SOIL - Manuscript Revision soil-2015-46

Dear Professor Jorge Mataix-Solera,

Please find attached our revised manuscript entitled:

“Quantification of the inevitable: The influence of soil macrofauna on soil water movement in rehabilitated open-cut mine land.”

We very much thank Artemi Cerdà for his review and constructive comments, and think the manuscript has greatly benefited from his suggestions. We have considered them all and our responses are provided on the following pages.

Thank you for your continued consideration of our manuscript and please contact us should you have any further questions.

Yours sincerely,
Elizabeth Williams

On behalf of Sven Arnold

Response to Reviewer (Artemi Cerdà)

(Pages and line numbers refer to those in the Reviewer’s Report)

Page 1, Line 16

The reviewer’s comment relating to the recolonisation of macrofauna being a benefit to rehabilitated land is a valuable point that both author’s agree with and understand was missing from the interpretation of the original text. Thus, clarification has been added to the first line of the abstract, which now reads:

Recolonisation of soil by macrofauna (especially ants, termites and earthworms) in rehabilitated open-cut mine sites is inevitable and, in terms of habitat restoration and function, typically of great value.

Page 1, Lines 19-20

The reviewer's suggestion of adding runoff generation and soil erosion to the hydrological processes influenced by soil invertebrates has been adopted.

Page 2, Line 13

We thank the reviewer for suggesting further references that support our manuscript and have included those that we believe are most relevant to our discussion.

Page 2, Line 19

Again, we thank the reviewer for suggesting another reference relating to fire affected soils, however, we did not think this paper was appropriate for the context of this sentence.

Page 3, Lines 2

The reviewer suggested that the manuscript would benefit from describing the effect of mining on soil properties and hydrology, and how important these are for ecosystem functioning. We acknowledge that this very important aspect was missing from the original manuscript and have included the sentences below to rectify. We also thank the reviewer for reference suggestions and have used the most relevant to the current discussion, as well as adding others that we thought were particularly pertinent. Although some of the suggested references were relevant to some degree, we felt that it would require too many words to explain how their studies related to our manuscript, which we thought was not appropriate for our short discussion piece and may detract from the main theme.

After mining activities are complete, the topography and physical soil properties are re-constructed in an attempt to establish the foundation of a self-sustaining ecosystem. *However, soil properties are still markedly different compared to unmined areas, including higher bulk density (Potter et al. 1987), lower soil water content and lower soil water potential (Ngugi et al. 2015). As soil development is integral in various ecosystem functions (e.g. carbon, nutrient and water cycles, and vegetation establishment; Pallavini et al. 2015; Smith et al. 2015), these alterations have long-lasting effects on successful ecosystem rehabilitation.*

Page 14, Line 1-2

The reviewer suggests avoiding grey literature as it can be difficult for the readers to find. We have added the web address that this article can be located, which should rectify this problem.

Page 16, Figure 1

The reviewer recommends a colour figure for the electronic version of the manuscript, however we feel that in this instance, this is unnecessary and would not provide any additional advantage to the interpretation of the figure.

Page 17, Figure 2

Again, the reviewer recommends a colour figure for the electronic version of the manuscript. As this figure displays a colour/shade gradient, we agree that this would greatly benefit the image. Thus, a colour version has been added to the amended manuscript.