

13 July 2022

Rod Hailstone

AARC

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Dear Rod

Peer Review of geomorphology assessment for Lake Vermont Meadowbrook Project

This document summarises the process undertaken for peer review of the geomorphology assessment undertaken for the Lake Vermont Meadowbrook Project (the Project). The Project is subject to an Environmental Impact Statement being prepared by AARC Environmental Solutions (AARC). The assessment was undertaken by WRM and peer reviewed by Alluvium.

Process

The WRM draft geomorphology report was provided on April 6, 2022 for review. Peer review commentary, both general themes and specific editorial comments were provided by Alluvium to AARC and WRM on April 26, 2022. A meeting (via Teams) between Jellinbah, AARC, WRM and Alluvium took place on May 5, 2022 to discuss the initial peer review. Revisions as agreed were then provided to Alluvium from WRM 9 June, 2022. Alluvium provided agreement with all revisions to AARC on 12 July, 2022.

Review commentary

The peer review of the draft raised several themes as well as specific edits. The themes raised were:

- Quantification of impacts to Boomerang Creek - there is a process for assessing impacts to channel morphology based on relativities in bedload inventory (what's there already), subsidence void space created in channel by mining and how long to infill based on sediment transport capacity (average material transport rates). This has been done on a few EIS's already for the Isaac River, was developed in the original *Isaac River cumulative impact assessment of mining developments* (Alluvium, 2009). At the moment we have pre and post flood modelling, with some qualifying statements, however no actual quantification of impacts.
- Links to goaf – do bottom up and top down cracks connect? The statements in report about thick sands and seepage will raise the question of where does that water end up. Quantification of volumes may end up getting linked in a trade off assessment against the next point.
- Ecology and general environmental outcome approach in the EIS - subsidence can create positive environmental outcomes in a net gain sense (re-establishment of wetlands in a landscape that's lost them due to gully erosion and land use). Is the language in other studies in EIS being taken down those lines?
- Interim scenarios – we have pre mining and 30 years into the future. An interim scenario (or two) should be looked at to understand geomorphic risks at points in time that will be different to the full mined scenario. Specifically, avulsion risk for the waterways was discussed as that will vary through time with regard to orientation and magnitude of subsidence relative to the waterway and floodplain.
- Cumulative impacts – assumptions were made regarding ongoing supply of sediment from upstream. The proposed Saraji East longwall mining operation will alter sediment supply, potentially transforming the streams from transport limited, to supply limited, changing the systems from depositional to erosional.

- Creation of drainage channels between subsidence ponds as mitigation – in dispersive soils, such mitigation can create greater export of sediment if not done to a high standard. Similarly, new flow paths due to subsidence over poorly vegetated dispersive soils also have high potential for creation of gullies that will require management.

These general themes and some specific edits were discussed on May 5, with agreement reached on resolution. The revised report provided by WRM on 9 June, 2022 adequately addresses these matters.

Regards



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environmental engineering (RPEQ)

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