Title of abstract (use ‘Title’ style)

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# ABSTRACT

The use of numerical methods to assess the risk of static liquefaction in tailings storage facility (TSF) slopes has increased significantly over the past decade. Much of this impetus has been driven by a series of major TSF failures attributed to static liquefaction, and finite difference (FD) models being used as part of the post-failure investigations. The FD models carried out have included both two and three-dimensional analyses, depending on capabilities of the available code/constitutive model, the geometry of the problem, and the spatial distribution of contributory soil layers. For valley TSFs and other constrained structures there is general agreement on the importances of three-dimensional. However, for paddock-style TSFs, common in regions like the Goldfields of Western Australia, two-dimensional (plane strain) analysis is often deemed sufficient due to the typically long, uniform slopes. However, anecdotal evidence of some failures (e.g., TVA Kingston) suggest that static liquefaction may initiate in corner areas where slope angles are lower, a somewhat counterintuitive observation.

This paper investigates the effects of corner geometry on uniform paddock-style TSFs using FLAC3D FD analyses. Tailings are modelled as loose, contractive material incrementally placed, with the NorSand constitutive model and parameters from Cadia tailings for comparison with previous relevant works.

Analysis of corner stress conditions reveals lower stress ratios due to reduced slope angles. However, changes in corner geometry also reduce the Lode angle, influencing the critical friction ratio and maintaining liquefaction potential similar to plane strain conditions. Implications for selection of typical sections in two dimensional analyses of paddock-type TSFs are discussed.