Processing of unsaleable ultrafines to potentially reduce the volume of iron ore tailings

E Mare[1]*, T Gerrans*

1. Principal Process Engineer, Sedgman, Perth WA 6000. elardus.mare@sedgman.com
2. Senior Study Manager, Sedgman, Perth WA 6000. trish.gerrans@sedgman.com

Keywords (Key phrases): TSF risks, tailings volume, scavenging, dewatering, potential Fe-recovery

ABSTRACT? (USE 'HEADING 1' STYLE)

Recent highly-publicised incidences of disastrous containment failures, none more pertinent than the 2019 iron ore tailings dam failure in Brumadinho, have focused the world's attention squarely on this often challenging subject. Unwanted ultrafines, that are deemed to be unworthy of further treatment or deemed not to have further saleable value, are therefore a significant issue for mine owners looking to reduce risks and perceptions associated with long-term storage of tailings.

In this context, there are strong drivers to identify safer approaches to ultrafine tailings management, especially if it can also lead to increased revenue, better water stewardship and worthier environmental perceptions.

The management of tailings needs to be considered from both containment challenge and processing opportunity perspectives. This paper focusses on the latter, reviewing from a technical and economic perspective, the feasibility of more extensive processing and/or re-processing of specifically iron ore tailings, in a bid to reduce the overall volume for management in long-term storage. Herein the opportunity lies in recovery processing, as much as enhanced thickening and/or mechanical dewatering, and therefore the paper discusses both issues as equally important sides of the same coin.

Recent interest in iron ore ultrafines processing studies suggests that the enhanced processing of iron ore tailings offers multiple advantages. Apart from a potential reduction in tailings volume, associated with safer containment, lower environmental impact and improved water management, the prospect of increased revenue from additional Fe-recovery presents supplementary motivation for iron ore players to embrace this approach, as further elaborated in this paper.