

ABSTRACT

Title: Deriving maximum value from Mineral Waste Streams

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Current mineral extraction and valorization activities still have a strong focus on the “delivered product(s)” which might be a bulk commodity such as hematite, bauxite, metallurgical coal, etc., and mineral concentrates such as metal sulphides, oxides, and carbonates; precious metals, such as gold, silver and PGMs, REEs or battery metals; halogen salt forming elements; or industrial minerals, which are non-metals including crushed rock, sand, and gravel, etc. With the current focus on tailings disposal, the push back has been to seek alternatives to the currently “conventional” disposal method via increasingly higher risk tailings settling facilities (TSFs) with a changing focus towards “dry disposal”. Whichever option is selected, the alarming trend is the increasing cost and growing ESG impacts. An emerging approach is to pose a focussing question “Is there anything else passing into the tailings stream and/or disposable waste streams which could be recovered and pass into the product revenue stream?” All of the above “primary” process streams offer opportunities for increasing recovery and offsetting some of the disposal costs. Some secondary opportunities are already being pursued, such as REEs and battery metals from base metals deposits, but other opportunities are still being overlooked, such as the recovery of building materials and also generation of soil conditioning pellets. These potential “new” product streams can also utilize other mining and domestic wastes such as smelting slags, glass waste, plastic waste, etc. This paper will address these opportunities and provide examples including process approach, economics and some of the current barriers that exist, which are holding back progress on such initiatives.

260 words