

Repurposing of mineral processing by-product

Business challenge

Rio Tinto is committed to continuously improve the safety and sustainability of mineral waste management. The repurposing of mineral processing by-products to reduce the scale of waste stockpiles is one way to leave a positive mining legacy for future generations.



(Quarter section of the pilot filter cake)

Rio Tinto is developing a mineral processing operation that will produce a pressure-filtered by-product using plate filter technology. Pilot plant samples of the by-product have been produced and extensively characterised. The major mineral species in the by-product are gypsum and magnesium/iron hydroxides. The material is cohesive and has a low moisture content that meets transportation requirements. We believe that the unique material properties open the door for a range of repurposing options.

We are looking for partners with innovative technologies and ideas for repurposing this material to help eliminate the need for storage and to make a lasting difference to local communities and the environment.

Major mineral components	P ₉₀ particle size [microns]	Solid phase density [dry t/m ³]
Gypsum (66 wt.%) and magnesium / iron-hydroxides (21 wt.%)	100	2.2

Solutions we seek

Our preference is to find high tonnage options for on-site use that are ready when the operation is commissioned (e.g. use as a raw material for producing underground backfill paste). Opportunities for selling the material for high tonnage commercial off-site applications are also of interest (e.g. use as an agricultural soil conditioner). Process solutions involving treatment or conversion into new materials will be considered.

We are not interested in options that would produce a new waste stream requiring on-site storage management.

Submissions will be assessed on a range of factors including the technology readiness level, suitability for large tonnages, value proposition, energy intensity, carbon footprint and social value aspects. We also want to understand what makes your solution innovative and why you would like to partner with us.

Timeline

The closing date for submissions is the 31st of October 2023. We will provide feedback by the end of November 2023 for each submission and discuss next steps for those we would like to progress. This would include setting up non-disclosure agreements and discussing the provision of pilot plant samples and access to filter cake characterisation data. We are open to reviewing the option for your team to directly utilise the laboratory facilities at our Bundoora (Melbourne, Australia) Technical Development Centre for proof-of-concept tests.

About your submission

We encourage you to include as much evidence as possible that can provide us with confidence in the feasibility and effectiveness of your solution or concept.

We may elect to proceed with any, all or none of the submissions. Similarly, there could be aspects of your solution that could work with other solutions, hence consider whether you would be willing to work with other third parties. This will be discussed on an individual basis.

You should include an assessment of your solution's technology readiness level, including a description of any required proof-of-concept testing.



Submit via the form on the [Rio Tinto Pioneer Portal](#) and agree to the Terms and Conditions. Notwithstanding, all submissions will be treated confidentially and not disclosed to third parties outside the Rio Tinto Group.

For further clarification, email pioneerportal@riotinto.com.