The Samarco dam disaster in 2015 killed 19 people and caused environmental havoc
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Miners pool resources to stop further tailings dam disasters

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Two of the world's biggest mining groups are working together on technology to remove water from mining waste in an attempt to prevent more deadly dam disasters.

BHP and Rio Tinto said they had formed a partnership to accelerate the development of filtration technology to treat mining waste, known as tailings, to enable safer storage and to save water. They plan to install an "innovative, large-volume filter unit" at BHP's Spence mine in Chile, with construction beginning next year and operations to commence in early 2024.

Tailings safety and water usage are two of the biggest environmental and sustainability challenges in mining. Most mining operations use large amounts of water to aid in the separation and concentration of ore from crushed waste rock. This produces a liquid slurry of waste metal, mineral particles and water, which typically is stored in a huge dam.

Two tailings dam disasters in Brazil have shown the huge safety risks involved. In 2015 the Fundao tailings dam at BHP and Vale's Samarco joint venture near Mariana in Minas Gerais province collapsed, killing 19 people. About 40 million cubic metres of toxic waste was released, polluting more than 400 miles of the Doce river system in Brazil's worst environmental disaster. BHP is facing a £5 billion lawsuit from 200,000 people seeking compensation.

In 2019 a tailings dam collapsed at Vale's Córrego do Feijão site near Brumadinho, also in Minas Gerais, killing 270 people, who were engulfed by a torrent of mining waste. Ethical investors including the Church of England Pensions board and the Swedish Council on Ethics have led a push for increased transparency and safety in the wake of the disaster.

Miners are also under pressure to reduce their environmental footprint by cutting water usage, especially in countries such as Chile, the world's biggest copper producer, which has been struggling with drought in some areas. However, the use of technology to filter tailings to allow them to be "dry-stacked" safely is still relatively limited.

The Doce river system was flooded with mud after a dam owned by Vale and BHP burst in 2015
RICARDO MORAES/REUTERS

Rio and BHP said the project in Chile would assess the potential of a large tailings filter unit for "scalability and cost-

effectiveness across global mining operations", after a smaller-scale deployment by Rio to treat waste from alumina refineries since 2005.

The test project aims to remove up to 80 per cent of water in the tailings before storage, paving the way for the water to be reused. The companies said the technology could enable the dry tailings to be used again as raw material for the glass, construction or agriculture industries.

Last year, when Samarco was partially restarted, BHP and Vale deployed a filtration system that they said would enable about 80 per cent of the tailings from the one operating concentrator to be dry-stacked, with the wet tailings stored underground in a disused mine.

Mark Davies, Rio Tinto's chief technical officer, said: "It is in everyone's interest that we, as an industry, find safer and more sustainable ways to manage tailings. As two of the leading companies in the sector, we want to bring our combined knowledge and expertise to address this challenge."

Shares in Rio Tinto rose 51p, or 1.1 per cent, to £45.37; BHP rose by 24½p, or 1.2 per cent, to £20.77.