

Miners eye breakthrough zero-carbon tech turning wastewater into pure water

New tech to accelerate sustainable and circular mining

PERTH, Australia – As more Australian miners pledge to be carbon neutral in the next two decades, a new innovative solar-powered technology that will extract pure water from waste streams is helping to push the sector towards becoming a circular economy.

The Flamingo concentrated solar distiller technology, offered by JWA Oilfield Supplies, harnesses solar energy to extract moisture from the waste streams generated by oil and gas and mining industries through a multi-distiller system, which then delivers pure distilled water and dried slurry output.

The breakthrough zero-carbon technology allows resource companies to not only reuse water for their own operations, but also to provide beneficial use of the treated water to the local communities, such as farming and irrigation, as well as rehabilitate ponds in water scarce environments – marking a major step towards creating a circular economy.

The ability to separate dry solids from sludge also presents many opportunities to close the loop and recycle minerals and resources that would otherwise be classified as waste.

“The benefits are many-fold. Firstly, this solves the challenge companies face in sourcing water for mine operations and in treating the wastewater after. Secondly, this runs on solar energy, so it leaves no carbon footprint and is far more economical than current water treatment systems,” Hensley Wee, business development manager at JWA Oilfield, said at the 2021 Austmine Conference in Perth.

The patented technology has the ability to purify low PH water to a standard that is cleaner than municipal water without the need of any chemical inputs, thus reducing environmental liabilities. It is also easily scalable for large operations, Wee said.

Water is a precious resource throughout Australia, especially in the outback where most oil and gas and mining operations are located. Such resource extraction activities are water intensive and competes with similarly large water needs of the agriculture sector.

The mining sector extracted 1070 gigalitres of water in 2018-19, accounting for a quarter of industry use minus consumption for electricity and gas generation, according to data by the Australian Bureau of Statistics. The sector re-used only about a third of the water consumed.

“Thirdly, the Flamingo’s ability to separate dry solids, such as bio-solids or salts, will also allow the mining industry to improve minerals or resource reclamation from sludge and progress towards a zero-impact future.”

For example, biosolids can be separated from feedstock runoff or sewage which means carbon is “locked in”. There is also the potential to increase soil health by the application of biosolids to depleted land areas – which has direct benefits for resource companies to meet its rehabilitation obligations, Wee said.

JWA has partnered with Bridgeport Energy (a subsidiary of New Hope Group NHS.AX) to trial the Flamingo concentrated solar treatment unit at one of its sites. JWA is also in discussions with other resource majors to use the Flamingo units at oil and gas, as well as mine sites.

Each Flamingo unit can produce up to 30kL of clean water a day which equates to 11 megalitres a year. Current treatment methods using membrane-based technology would require around 45 to 150 MWh of electricity a year to treat the equivalent amount of water. Therefore, the novel technology can bring greenhouse gas savings of around 450 to 1,800 tonnes of CO2 per year.

The innovative water treatment technology has already won several awards, including the METS Ignited Collaborative Projects grant backed by the Queensland government and was also one of the finalists in the innovation award organised by the Resource Industry Network.

About Flamingo Treatment Units:

The patented concentrated solar technology uses highly reflective massive mirrors to focus solar irradiance on its multi distiller system to directly

extract steam from waste streams, which will allow purified distilled water and dried slurry outputs to be collected. The novel process exploits thermodynamics principles and recycles the heat within the device to achieve a 5-fold increase of throughput.

About JWA:

JWA Oilfield Supplies is an Australian company committed to providing innovative and environmentally sustainable solutions to the resources and industrial sectors. Our company has supported major energy and infrastructure projects across the country, including the construction of LNG projects, road and rail programs and renewable developments.

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