

COMBINING IN SITU RECOVERY AND ION EXCHANGE AT THE KAPUNDA COPPER PROJECT

By

¹Jim Wall, ¹Volha Yahorava, and ²Leon Faulkner

¹Clean TeQ Water, Australia

²EnviroCopper Ltd, Australia

Presenter and Corresponding Author

Jim Wall

ABSTRACT

The Kapunda project in South Australia continues to advance through its development stages. Located in a historic mining jurisdiction, the project would see a stranded mineral deposit revitalised as Australia's first fractured rock copper in situ recovery (ISR) installation. A Site Environmental Lixiviant Trial (SELT) was completed recently by EnviroCopper, successfully demonstrating technological and environmental advancements. Downstream flowsheet development has now commenced, with the assessment of processing options and final copper product options (e.g. salt or metal).

Ion exchange is the leading process option for the recovery, upgrade, and purification of copper from the ISR pregnant leach solution (PLS). Clean TeQ Water, an Australia-based provider of moving bed ion exchange technology to the mining and water sectors, was engaged to demonstrate the viability of copper recovery using continuous ion exchange from the Kapunda PLS produced during the SELT. Iminodiacetic acid (IDA) ion exchange resin was utilised to generate a copper sulfate rich liquor from which copper sulfate was crystallised.

This paper presents the outcomes of the process development and demonstration work, and the associated study undertaken by Clean TeQ Water. The main focus of the program was to recover, upgrade, and produce purified high grade copper sulfate liquor suitable for final product formation. Several pre- and post-treatment options for the copper-bearing streams were examined, along with evaluation of various ion exchange column designs. The most economically attractive flowsheet for the project was subsequently identified.

More broadly, these findings could be applied to other copper ISR applications and the general recovery of value metals from dilute streams, such as pit water, bleed streams and other industrial wastewaters.

Keywords: in situ recovery, copper, ion exchange, moving bed ion exchange