

### **The Geology and Breccia Evolution of the Havieron Breccia-Hosted Au-Cu Deposit**

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The Havieron breccia-hosted Au-Cu deposit was discovered in 2018 under approximately 420 m of post-mineralisation Permian glacial cover. It is located in the Paterson Province of Western Australia and hosted by lower greenschist metamorphosed sedimentary rocks of the Yeneena Basin, which also host the Telfer and Winu Au-Cu deposits. Pre-mining resources estimate that Havieron contains >7 Moz Au and 275 Kt of Cu. Mineralisation at Havieron is exclusively hosted in a large breccia complex that preserves evidence of the evolution of brecciation and mineralisation. The initial stages of brecciation evolved from quartz- and actinolite-cemented to actinolite-, biotite-, and carbonate-cemented breccias, locally with corroded clasts. Later stages of breccia formed through solution collapse and were cemented by carbonate. Rheological and chemical contrasts between the host meta-siltstone and meta-sandstone units containing variable carbonate content, and with dolerite sills localised breccia formation and high-grade mineralisation. Havieron has an unusual Au-Cu-Bi-Te-Ni-Co-W-REE-Sn metal association, reduced (pyrrhotite-stable) mineralogy, intimate connection to magmatism and is hosted by a large scale magmatic-hydrothermal breccia complex. Havieron is therefore interpreted to be a variation on the proximal style of intrusion-related Au-Cu deposit, that contrasts with the distal intrusion-related Au-Cu deposits that occur at Telfer and Winu. The recent discoveries of Winu and Havieron highlight the varied deposit styles and prospective nature of the Paterson Province, and the importance of effective exploration under post mineralisation cover.