

SEG 2024 Conference: Sustainable Mineral Exploration and Development

The Discovery Under Cover of the 1.3-Moz Dokwe Gold Project, SW Zimbabwe

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The c.1.3-Moz Dokwe gold deposit is located within a previously undefined Archaean terrane, extending from the Maitengwe Greenstone Belt in Botswana and linking up with the Bulawayo-Bubi Greenstone Belt in Zimbabwe. As the Archaean units are overlain by Karoo and Kalahari sedimentary units of up to 25-40m in thickness, an innovative geochemical method was utilised to detect the deposit under cover. The east-northeast striking greenstone belt is accompanied by complex folding and thrust imbrication and is dissected by a series of major subparallel sinistral shear zones.

At the Dokwe Gold Project area, the barren sedimentary cover is dominated by calcrete, with a few metres of sand at the surface, and mudstone and sandstone located towards the base. The basement Archaean volcanic sequence comprises a series of quartz-rich volcanoclastic units, tuffs, and agglomerates, that grade into felsic irregular rhyolitic flows; intermediate vesicular dacite; agglomerates and andesites, which were subject to greenschist facies metamorphism. The sequence appears intruded by near syn-depositional quartz porphyries and later by dolerite. Brittle deformation, characterised by fracturing, is common in felsic tuff and porphyry units whilst more ductile deformation characterises the dacitic and andesitic units.

Dokwe North is characterised as a large low-grade deposit containing relatively few quartz veins, containing several very high-grade zones including visible gold. Dokwe Central is a smaller higher-grade pipe-like deposit containing abundant quartz veins and defined by several long high-grade zones. The two deposits appear to be strongly structurally controlled, occupying two distinct structural domains within a broad ENE trending shear zone. Gold mineralisation at Dokwe North is associated with silicified zones containing thin quartz-carbonate pyrite veins in addition to disseminated and fine-grained pyrite. Much of the economic gold mineralisation occurs in the dacitic unit and in the overlying felsic tuff, with lesser mineralisation in the quartz porphyry and andesitic units.