

### Fast-Tracking Brownfields Exploration at Geita: Unleashing the Power of 3D Seismic and Cutting-Edge Seismic Innovations

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Greenstone belts, historically recognised and extensively explored for their gold resources, remain prime candidates for brownfields exploration. However, revitalising an area that has already undergone extensive mining and exploration activity can be challenging. The key lies in harnessing the wealth of geological data gathered over time to uncover fresh insights and provide confidence in exploration concepts.

This case study focuses on the Geita Gold Mine, Tanzania. Where reprocessing of legacy 3D seismic data using Kirchhoff Pre-stack Depth Migration coupled with the use of Fleet's patented SEISOMICS workflow, has yielded valuable information about the local geology and mineral system. The SEISOMICS workflow uses variations in the texture of the seismic data to automatically extract geological features and produces 3D geobodies that can be related back to the known geology.

The Geita deposits are hosted in a package of iron-rich supracrustal rocks intruded by the Nyankanga intrusive complex, the area has been affected by seven deformation events resulting in complex patterns of folding, ductile shearing and brittle faulting (Kwelwa et al, 2018). Gold mineralisation is controlled by the intersection of iron-rich stratigraphy and the moderately north-dipping Geita structural trend. The SEISOMICS shows two distinct seismic domains that correspond with iron-rich stratigraphic packages. Viewing the domains as 3D geobodies highlights the distribution of iron-rich stratigraphy in a volume of around 20km<sup>3</sup> and allows visualisation of major folding and structural offsets of these units.

The intersection of predicted iron-rich stratigraphy with the north-dipping Geita structural trend is used as a guide for targeting down-plunge extensions of known mineralisation, significantly reducing the exploration search space and highlighting the most prospective areas to target beneath current mining. The highest priority target is a shallow west plunging zone beneath the Geita Hill Mine area that has potential to extend mineralisation to over 1km below surface.