

### **Structural Controls on a High-Grade BIF-Hosted Gold System: Umwelt Deposit Case Study, Back River Gold District, Nunavut, Canada**

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The Umwelt Deposit is the largest of five deposits that make up B2 Gold's Goose Project, part of the Back River Gold District (BRGD) located in the Slave Geological Province of the Canadian Shield. The BRGD is underlain by the Archean Beechey Lake Group, a thick turbidite succession in the greater Burwash Basin. Banded Iron Formation (BIF), comprising both oxide and silicate facies, occurs as thin but laterally continuous horizons interleaved in the sedimentary sequence.

The Slave Province underwent multiple contractional events between ca. 2.64 – 2.58 Ga, attributed to a series of collisions along the eastern margin of the Slave protocontinent. The most significant of these events was a protracted D2 shortening event between ca. 2.61 – 2.59 Ga, which resulted in the development of tight to isoclinal northwest-trending folds, attendant axial planar foliation (S2), and localized high strain zones. Syn-tectonic gold mineralization is concentrated in structural traps in the F2 fold architecture, and in veins and vein arrays genetically linked to the S2 fabric. Umwelt hosts combined open pit and underground reserves of over 6.4 million tonnes at > 8 g/t Au, preferentially occurring within the hinge zone and short limb of a moderately southeast-plunging asymmetric F2 fold.

With the advancement of Umwelt toward commercial production in 2025, infill drilling and underground development has provided some clarity on the controls on mineralization that were not fully realized during the early exploration phase. Key observations include: the presence of cryptic high-strain zones; the role of re-folding and second order folds on localizing gold; the influence of syn-kinematic QFP dykes on vein emplacement; and the identification of deformed extensional vein arrays. All help piece together the paragenetic history of the Umwelt deposit that will guide exploration of other BIF-hosted gold targets throughout the Back River Gold District.