

Geology of the 3.7 Moz gold, banded iron formation-hosted Amaruq project, Nunavut

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The Amaruq gold exploration project is owned by Agnico Eagle Mines Ltd (total resources of 3.71 million ounces of gold at 5.97 g/t) and is located 50 kilometers NW of the Meadowbank mine in Nunavut. The Amaruq area is underlain by the Archean supracrustal rocks of the Woodburn Lake Group (2.71 Ga), within the Rae Domain of the Churchill Province. In this area, the Woodburn Lake Group is composed of a 250 m-thick horizon of mafic-ultramafic volcanic and intrusive rocks intercalated with chert and silicate-facies iron formations. This volcanosedimentary package is bounded by plagioclase-quartz-biotite-sericite greywacke. The Woodburn Lake Group was deformed and metamorphosed in the Archean and during the Paleoproterozoic Trans-Hudson orogeny (1.8 Ga). The Amaruq mineralized zones are affected by at least three phases of Paleoproterozoic deformation, with peak metamorphic conditions at upper greenschist to lower amphibolite facies. The main deformation, D_p , is represented by a moderately to steeply SE-dipping schistosity, by shallow-plunging (0-30°) tight to isoclinal folds, and by NW-verging thrust faults. The two main gold zones of the Amaruq property (Whale Tail and IVR) have different ore and alteration styles. The Whale Tail zone is primarily characterized by stratabound and discordant, disseminated to semi-massive pyrrhotite-arsenopyrite-gold in silicate-facies iron formations, as well as by zones of silica flooding in chert layers with gold spatially associated with arsenopyrite. The IVR zone outcrops 300 meters NE of the Whale Tail zone in a fold hinge zone where three deformation phases are documented. Although chert and iron formation replacements are present, the IVR zone is dominantly characterized by shallow-dipping quartz \pm carbonate veins in mafic-ultramafic and sedimentary units that show sericite, biotite and/or carbonate alteration. There are several sets of veins at the IVR property that contain visible gold, arsenopyrite, and/or traces of galena. Crosscutting relationships indicate that the quartz \pm carbonate veins predate or are coeval with D_p . Mafic-ultramafic and chemical sedimentary rocks, together with the presence of arsenopyrite and D_p structures (folds and thrusts), appear to be critical at Amaruq. The Amaruq property comprises major auriferous zones that are clearly distinct in style from other known gold occurrences in the region. Ongoing research at Amaruq aims to better understand the key ore-forming processes and to define their diagnostic characteristics, which will help vector toward environments with potential for gold mineralization in the Churchill and other Archean terranes.