Itillliarsuk is located in the Disko-Nuussuaq area in West Greenland. The area is characterised by Archean basement (Rae Craton) and the Nuussuaq Basin with sediments up to 8 km thick. The basin was also affected by extensive basalt volcanism during the Paleogene in connection with sea-floor spreading. Regional extensional faults, oriented roughly N-S, segment the basin and the overlying plateau basalts.

The Rae Craton consists of Meso- to Neoarchean orthogneisses and supracrustal sequences. These sequences include three greenstone belts - the Saqqaq, Itilliarsuk and Arveprinsen-Eqi belts.

The Itilliarsuk greenstone belt consists of garnet-mica and biotite-garnet schists, metaconglomerate, amphibolite, metagabbro, BIF and calc-silicate rocks, up to 2.5 km thick. Geochemical analyses indicate formation in a back-arc setting.

Itilliarsuk, together with the other two greenstone belts, form the Ataa gold province.

Regional Geological Map showing Itilliarsuk (Itilliarsuup) within the Ataa gold province (Haugaard et al., 2013, and references within).

Local Geology and Mineralisation

Itilliarsuk (69° 58’N, 50° 58’W) hosts two mineral prospects: BIF-related iron and vein-hosted gold.

The ~2.9 Ga BIF strikes subparallel to the regional foliation, ENE-WSE, in a 3–4 km long and 700–1000 m wide zone. It dips moderately to steeply, and is characterised by extensive internal deformation with isoclinal folding, and NW- and NE-vergent thrusts.

The BIF consists of very fine-grained bulk bands ranging from 1 cm to 15 m in thickness. The black bands are Fe-rich and are highly magnetic, and are generally finely laminated with 1–2 mm bands of microcrystalline quartz. There is strong chemical variation within the formation - from a chemically pure to a more shaley BIF with a clastic component. Magnetite concentrations also vary across and along the strike of the layers. Strong magnetic anomalies outline distinct magnetite zones indicating a significant potential for higher grade and/or larger tonnage iron ore at greater depths.

Gold mineralisation is hosted within auriferous quartz veins relating to shear zones in the BIF, amphibolite and biotite schists. Host rocks show various alterations throughout, including silicification, sericitization, sulphide impregnation and carbonitisation. Six different zones of gold mineralisation have been identified with a strike length up to 500 m, and variable grades.
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**Exploration History**

- **1967**
  - Discovery of the BIF by Kryolitselskabet Øresund during regional aeromagnetic survey. Subsequent area visit in 1978-1979.

- **1994 - 1998**
  - Exploration by NunaOil - mapping, rock and sediment sampling, drilling (6 holes totalling 1,482 m).

- **2008 - 2011**
  - Avannaa Resources exploration - mapping, aeromagnetic survey, rock and soil sampling, ground geomagnetic survey, soil gas hydrocarbons sampling.

**Grades, Resource Estimates**

Non-compliant inferred resource of 91 Mt @33.4% Fe₂O₃ (cut-off 22.5% Fe₂O₃). Magnetite content up to 41%. Grab samples yielded up to 41 g/t Au, whereas channel samples were up to 15 g/t Au.

**Key References**


**Conclusion**

Itilliarsuk calls for further exploration to outline its true iron ore and gold potential. As the measured magnetic anomalies cannot be accounted for on the surface, there is a strong indication of an unidentified higher grade and/or larger tonnage iron deposit at depth. Previous gold exploration points to a high grade, low tonnage gold deposit, with further potential in the area.