

REGIONAL BEDROCK MAPPING OF THE SOUTHEASTERN CHRUCHILL PROVINCE, WESTERN LABRADOR

Peter Valley

Preliminary 1:50,000 bedrock mapping was initiated in the Crossroads Lake area of western Labrador. This project is part of a joint Geo-mapping for Energy and Minerals (GEM) project with the Quebec Geological Survey and the Geological Survey of Canada. Parts of the southeastern Churchill Province (SECP) are exposed in map areas 23I/10, 11, 14 and 15. The SECP in this area consists of Mesoproterozoic megacrystic and medium-grained charnockite of the De Pas batholith, gabbro-norite migmatite of uncertain age, and highly deformed Archean granite. The De Pas batholith is well exposed in the central part of the study area. The megacrystic charnockite contains crystals of perthitic feldspar up to 10 cm long. Orthopyroxene in the charnockite is of primary igneous origin and is often rimmed by biotite and quartz or amphibole and quartz as a result of a more evolved magma or later metamorphism under fluid-present conditions. Blocks of medium-grained charnockite and the gabbro-norite were found in the megacrystic charnockite. Contamination of the charnockite by mafic minerals occurred where blocks of gabbro norite had been partially melted leaving behind pyroxene residuum. The gabbro-norite may be migmatitic. Leucosomes consist of plagioclase, clinopyroxene, amphibole, biotite and magnetite. The medium-grained charnockite contains ubiquitous mafic enclaves and schlieren that are pieces of dismembered mafic dikes. Enclaves are often randomly oriented. The medium-grained charnockite tends to occur at the periphery of the megacrystic charnockite. The Archean granite is highly deformed, migmatitic and contains a diagnostic quartz-ribbon lineation and numerous mafic and migmatitic layers.

The megacrystic charnockite is little deformed except in discrete shear zones where the rock has experienced intense ductile shearing. Deformation in all units is focused along N-S- or NW-SE-trending shear zones. Kinematic indicators suggest that the region has experienced right lateral transpression. A new high-resolution airborne aeromagnetic survey, flown by the Geological Survey of Canada, shows a good correlation of rock type and deformation with the aeromagnetic anomalies. No evidence for mineralization was observed.



Megacrystic charnockite of the De Pas batholith.



Migmatitic quartz-ribbon granite.



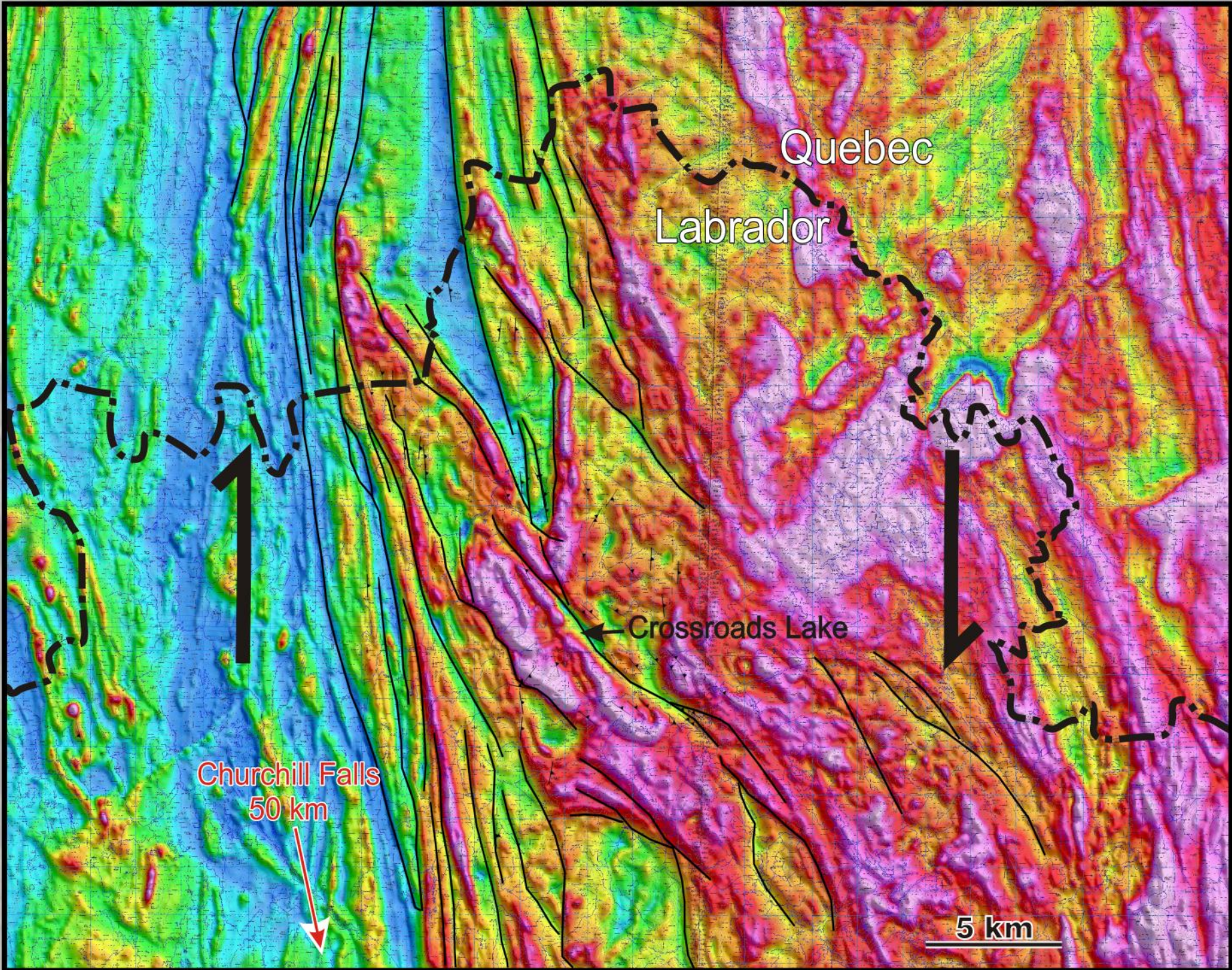
Migmatitic gabbro-norite. Leucosomes are comprised of plagioclase, clinopyroxene, magnetite and orthopyroxene. Paleosomes are mostly plagioclase, clinopyroxene, orthopyroxene, biotite and amphibole.



Gabbro-norite enclave being "digested" by megacrystic granite. Photo taken 1 meter below contact of gabbro-norite and charnockite.



Typical terrane associated with the De Pas batholith in the Crossroads Lake area of western Labrador.



GEM high-resolution aeromagnetic map and locations of probable right-lateral transpressional shear zones. Arrows indicate dextral shear.



Ductile deformation in the megacrystic charnockite and bifurcating mafic dyke.



Fine- to medium-grained charnockite containing enclaves and schlieren of former mafic dikes. The enclaves are composed plagioclase and amphibole. During assimilation into the charnockite, the amphibole reacted to form clinopyroxene and orthopyroxene.