

The Potential for Rare Metal and Gemstone Mineralisation in the Air Mountains, Republic of Niger

by Wolfgang Hampel (2000), 26 pages, 7 figures, 6 tables and 2 annexes

Client: GeoAfrica Gold Corporation, Sydney/Australia

Position held: Consultant Geologist

Scope of study: An evaluation of the geological potential for economically exploitable deposits of speciality metals (Ta/Nb, Sn, REE, Li, Cs, Rb, etc.) and coloured gemstones in the 70,000 sqkm Air Mountains, Niger. Further to that, a two-month exploration program and a detailed budget were to be proposed.

Work carried out:

- compilation of all available data
- detailed description and interpretation of the geology
- description of known mineralisation
- development of metallogenetic models
- economic considerations
- description and classification of targets
- detailed methodology of sampling and assaying
- proposition of laboratory and local staff
- proposition of detailed work program
- proposition of a US \$ 100,000 budget (all inclusive)

RESULTS:

Geological setting: The Air Massif is part of the Touareg Shield and the Panafrican Mobile Belt. Major deformations during the Cryogenian (750-660 Ma) and Vendian (650-550 Ma). The crystalline, strongly metamorphosed Suggarian basement was intruded by subduction-related Pan-African granitic rocks (Older Granites). To the west it is separated from the surrounding slightly metamorphosed series by the major Tafadek overthrust, and to the east by the Aouezegeur overthrust. Palaeozoic **alkaline ring complexes** (photo) intruded into the basement and are amongst the largest in the world ('Younger Granites Province' of West Africa). Tertiary to recent volcanics are widespread in the SE of the Air Massif.

Potential for rare metals:

- eluvial tin is mined since 100y with minor W, Ta/Nb

Excellent potential for:

- stockwork/greisen with Sn-Li-W
- pegmatites with Sn-Ta/Nb-Li-Cs-Rb-REE-Sc, Be, etc.
- hyperalk. syenites with Nb-Zr-Be
- Veins/lodes with Sn-W-base metals
- Rapakivi granites with Sn-Be-W-base metals
- Secondary deposits with Ta/Nb, Sn, REE, W, Sc, etc.

Potential for coloured gemstones:

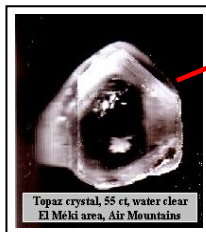
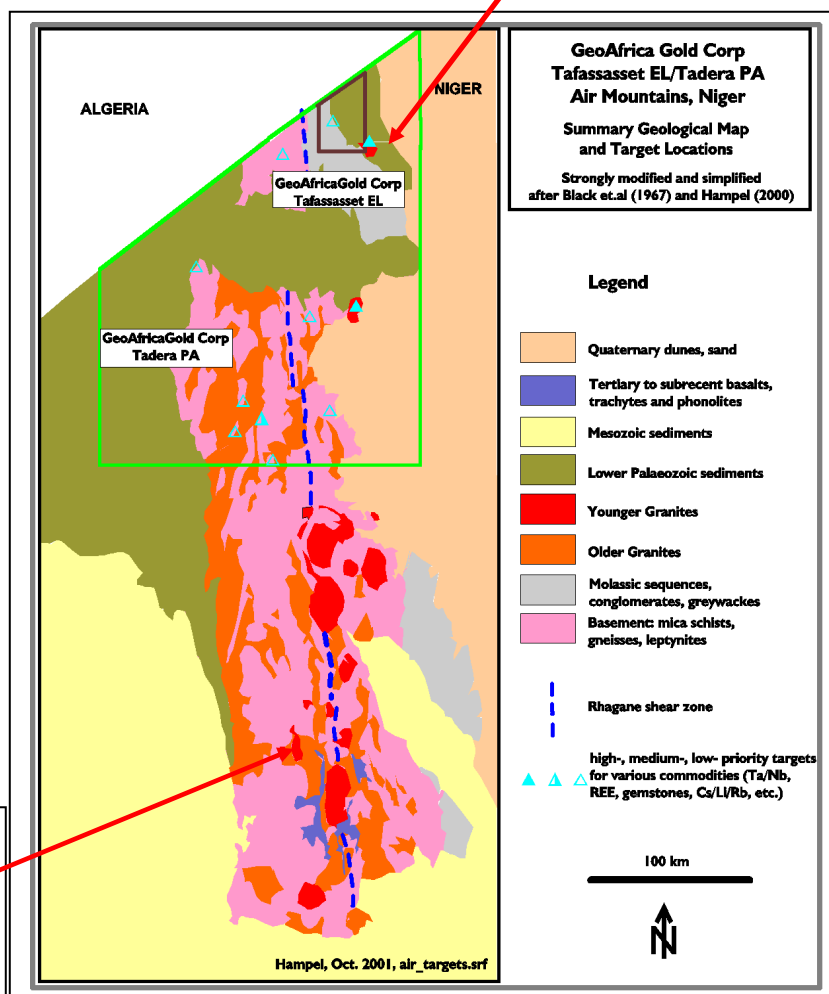
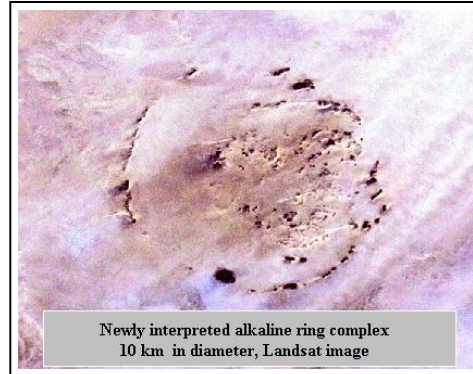
- to-date only gem-quality topaz (photo) and beryl are known

Excellent potential for:

- pegmatite-related gems (rubies, emerald, sapphire, garnet, etc.)
- skarn-related gems (rubies, etc.)
- schist-hosted gems (zoisite, emerald)
- volcanics with opal and sapphire
- secondary deposits

Please note:

The Air Massif offers also an excellent potential for base/ ferrous metals (Cu, Ti, etc.) + lamproite-hosted diamonds. These commodities were not covered in the report but are known from the Air and/or the Hoggar/Algeria.



Compilation map of the Air Massif, Niger showing the principal targets and geological units (reduced scale)

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