NOTES

A NOTE ON GOLD MINERALISATION IN BANDED IRON FORMATION, CHINMULGUND, SHIMOGA SCHIST BELT, KARNATAKA.

Banded iron formation hosted gold mineralisation has been reported from the shield areas of Australia (Finucane, 1953) (Lennonville, Boogardie, Yeligarn, Western Australia), Canada (Thomson, 1939; Barret and Johnson, 1948) (Central Patricia Mine, Crow river district, Ontario, Hard Rock Gold Mine near Geraldton, Ontario) and Zimbabwe (Harrison, 1970; Stagman, 1961; Foster *et al.* 1986) (Broomstock Mine Kwekwe Greenstone belt, Golden Kopje Mine, Chinhogi Greenstone belt). Similar banded iron formation-hosted gold mineralisations have been identified from Mallappakonda in Kolar schist belt, Ajjanahalli in Chitradurga schist belt and Chinmulgund in Shimoga schist belt. This note describes gold mineralisation in Chinmulgund area which was cursorily examined by M/S. John Taylor's and investigated by Geological Survey of India (Pushkar Singh & A.J. Rao, 1971) wherein only quartz veins were sampled indicating sporadic gold values.

Chinmulgund (14°35'00"N: 75°24'00"E) is situated in Hirekerur taluk of Dharwar district, Karnataka State and can be approached by a good metalled road from Motebennur situated 322 km from Bangalore on the National Highway No.4.

The sulphidic banded iron formation belonging to the Hiriyur Formation of Chitradurga Group (Biswas, 1974) form NW-SE striking ridges near Chinmulgund (48-N/6) in the northern part of Shimoga schist belt. Gold mineralisation is syngenetic stratabound stratiform in the banded iron formation. Ancient workings are seen over a strike length of about 3 km. Structurally the area forms an overturned anticline, plunging at low to moderate angles towards northwest.

The area comprises sericite-chlorite-phyllite/schist, argillites, greywackes and banded iron formations (BMQ) associated with very thin pyritiferous-magnetite tuff. Thin impersistant quartz veins traverse the different lithounits. The strike of the lithounits vary from NNW-SSE to NW-SE with 30° to 60° dip in southwesterly direction. The auriferous iron formation and the associated rocks have been folded into an overturned antiform, plunging at a low to moderate angle towards northwest with axial plane dipping 40° to 55° towards west.

The banded magnetite quartzite consists of alternating ferruginous and siliceous laminae, the individual laminae varying in width from 1 mm to 20 mm. The ferruginous laminae are made up of fine dark grey/brown magnetite with well developed euhedral crystals of magnetite. Alteration of magnetite to haematite is common in the oxidised horizon. Dull white to pale brown cherty quartz forms the siliceous laminae. Thin discontinuous bands rich in cummingtonite/grunerite occur as partings within the iron formation. The contact between the banded magnetite quartzite and phyllite/chlorite schist is sharp and is marked by a thin pyritiferous meta-tuff bed having clots of mica and euhedral crystals of magnetite and pyrite. Microscopically, the BMQ consists of granulated quartz, magnetite, cummingtonite/grunerite, biotite, chlorite and carbonates.

The extensive ancient workings serve as important indications of occurrences of gold in the area. Large dumps and numerous pounding marks have been located. Of the over three hundred samples of BMQ and associated schist/tuff panned, ninety samples (30%) showed visible gold on panning attesting to the auriferous nature of the formations.

The auriferous zones with gold values of 2 to 6 g/t over widths of 2 to 5 m, traceable for 100 to 300 m strike length have been recorded. Gold values are as high as 29 g/t and 50 g/t at places.

The gold mineralisation in this area is mainly syngenetic stratabound and stratiform manifested by fine layer parallel pyrite, pyrrhotite and a few arsenopyrite and chalcopyrite.

Banded magnetite quartzite forms the host for mineralisation with favourable zones being the sulphide rich, fractured and sheared, silicified, carbonated portions. Fine intercalations and partings of sericitised schist and tuff units within the BMQ are also auriferous. Subhedral crystals of pyrite and arsenopyrite of sizes ranging from fine to coarse (occasionally upto 10 mm x 20 mm) are rimmed by fine disseminations of sulphides suggesting that the sulphides are of two generations. The percentage of sulphides on visual estimation vary from 3 to 10%.

Enrichment of gold values by remobilisation is noticed in the structurally favourable loci like fold hinges and shears as evidenced by emplacement of quartz-carbonate veins. The presence of auriferous zones as mentioned above, spread of ancient workings over a distance of 3.5 km and occurrence of a number of parallel BIF bands in the area enhance the scope of good potentiality of the prospect. Ancient workings for gold exist near Karjgi (Toposheet 48 N/5) and the BIF hosted gold mineralisation with values upto 4 g/t over 3.5 m width for a strike length of 150 m has been recorded. The identification and delineation of auriferous zones in this milieu will throw open vast areas in locating more low grade large tonnage gold prospects in banded iron formations in other parts of Peninsular India.

Geological Survey of India
Karnataka Circle,
Jayanagar, Bangalore-560 011.

R. MADUSUDAN
M.VENKATASUBRAMANIAN
T.S.S. MURTHY.

References

BISWAS, S.K. (1974). Geology of parts of Byadgi, Hirekerur and Haveri taluks. Records. Geol. Surv. India. v.108.

FOSTER, R.P. (1989). Archaean gold mineralisation in Zimbabwe:Implications for metallogenesis and exploration.

JOHN TAYLOR & SONS (1906). Report on the old gold mines of India. v. IV.

OBERTUR, T., SAAGER, R. and TOMSCHI, H.P. (1990). Geological, mineralogical and geochemical aspects of Archaean banded iron formation hosted gold deposits: Some examples from Southern Africa. Mineral deposits 25 (Supple.) S 125-S 135 (1990).

PUSHKAR SINGH and RAO, A.J. (1971). Investigation for gold in Chinmulgund, Records. Geol. Surv. India. v.105.

DIRECTORY OF SENIOR SCIENTISTS UTILISATION OF SCIENTIFIC EXPERTISE OF RETIRED SCIENTISTS (USERS)

A large number of eminent senior scientists and engineers in the country remain active and deeply motivated to participate in the science and technology development activities even after superannuation. The Department of Science & Technology would like to benefit from their experience and expertise on evaluation and monitoring of projects. The department has also been implementing a scheme for Utilization of Scientific Expertise of Retired Scientists (USERS) with the following objectives:

To promote preparation of State-of-Art reports, monographs etc.

To promote development of educational material including teaching and audio-visual aids.

To encourage action research projects of integrated rural development.

To popularise science and promote scientific temper.

In order to generate a data base on the expertise of the senior scientists, the Department of Science & Technology proposes to bring out a directory of senior scientists/ engineers. The Scientists who have retired from service or are likely to retire within the next few months and desirous of being included in the directory may kindly send their bio-data on prescribed format available from The Director, Human Resources (USERS Scheme), Department of Science & Technology, New Delhi-110 016.