

## NOTES

### GROUNDWATER QUALITY PERSPECTIVE

A recent special volume of the *Journal & Australian Geology and Geophysics* (vol.14 Numbers 2 & 3 1993, 318p.) contains both overview papers and case studies of groundwater pollution and remediation. Of special interest are the papers:

- (1) Assessment of the relative vulnerability of ground water to pollution.
- (2) Risk assessment as a framework for management of aquifers - a literature review.
- (3) Technology selection for remediation of organic pollutants.
- (4) Wastewater irrigation and ground water quality protection guidelines for Australia.
- (5) National ground water protection guidelines for Australia
- (6) Towards an Australian ground water quality assessment programme.

A few of the recommendations that originated from the conference are (i) a community education programme, (ii) a coordinated programme to quantify the impact of various industrial, residential and agricultural, land and waste management practices on ground water, (iii) need for a national management programme for the protection and sustainable use of ground water, (iv) establishing a programme to identify principles of appropriate monitoring of ground water quality to determine man's impact and to facilitate prevention, rather than remediation, of ground water pollution problems and (v) establishing performance criteria to assess the application of the Guidelines for Ground Water Pollution progressively with the implementation of monitoring.

These are not only applicable to Australia but to other areas like India too. Our emphasis has so far been mostly on the quantitative aspects. The worth of the resource depends on its quality too. While considerable information is available on the major ion composition, very little is known about the trace elements and minor constituents. The recommendations of the conference and the proceedings of the specialist workshops provide interesting reading. It is a timely contribution and a 'must read' for those concerned with the management of this resource.

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### EVIDENCE OF PGE MINERALIZATION IN THE CHANNAGIRI MAFIC COMPLEX, SHIMOGA DISTRICT, KARNATAKA

In a recent reconnaissance investigation of the mafic-ultramafic body, designated here as the Channagiri mafic complex, in the southeastern portion of the Shimoga schist belt (Lat. 13° 44' - 13° 55' N; Long. 75° 48' - 76° 02' E) significantly high values of Platinum Group Elements (PGE) have been recorded. The mineralisation is localized to a 1.5 km (NS) x 50m (EW) chromitite seam located approximately 2 km north of Tavarekere village (Lat. 13° 51'

N: Long. 75° 57.5' E) known for the occurrence of vanadium-bearing titaniferous magnetite deposits. The chromitite band showing evidence of PGE mineralisation is almost entirely composed of iron-rich chromite and ripidolite variety of chlorite. To the north as well as to the south and west of the chromitite seam several isolated V-Ti magnetite bodies occur. No field gradation from chromite to V-Ti magnetite has, however, been noted. Neither has PGE mineralisation been identified in the magnetite seams nor in the host meta-ultramafite.

The PGE are present as minute mineral and alloy inclusions, measuring on an average 5 milimicrons, more commonly in chromite than in chlorite. The PGE minerals identified are *sperrylite* (arsenide of Pt and Pd with variable Rh concentration), *hollingworthite* (arsenosulfide of Rh, Pt and Ir with variable Ni and Co), *laurite* (sulfide of Ru and Os with variable Ir, As, Rh and Co) and *Iraursite* (arsenosulphide of Ir, Os and Rh with variable Rh and Co contents) and various alloys of Pt-Pd-(Fe Mn) and Pb-Sb.

One selected Instrumental Neutron Activation Analysis (INAA) of the chromitite sample with ore level PGE concentration and three analyses of the most common PGE minerals obtained using JEOL JCSA electron probe equipped with Link AN 10000 Energy Dispersive Spectrometer are given below.

Chromitite Bulk Sample Analysis	Os	Ir	Ru	Rh	Pt	Pd	Au	
3/IND/93 (values in ppm)	0.043	0.084	0.04	0.385	4.0	1.7	0.029	
PGE Mineral Analyses (Values in wt.%)								
Sperrylite (3-IND-93)	Pt	Pd	Rh	Ir	Os	Ru	S	As
	25.91	6.59	1.39	-	-	-	-	66.11
Hollingworthite (3-IND-93)	7.02	-	20.06	2.35	-	3.15	32.9	34.52
Laurite (JS-159C)	-	-	-	6.24	24.78	34.06	34.92	

At present concentrations of PGE in excess of 5 to 6 ppm are viable for commercial extraction. The Channagiri findings can be expected to provide certain basic field and mineralogical guides for PGE mineralization and serve as a stimulus for intensified exploration activity. Encouraged by the findings reported here, the present authors are pursuing their efforts for the location of PGE reefs at Channagiri and other areas having a similar field setting.

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