

## *Analytical Techniques*

Samples were analysed at the Department of Geology and the Central Analytical Facility of the Faculty of Sciences at the Rand Afrikaans University. Hand sample descriptions, transmitted light petrography, X-ray powder diffraction and scanning electron microscopy were used to qualitatively identify mineral phases present in the various samples.

### Microscopy

A Leica DMLP petrographic microscope hosted at the Department of Geology, RAU, was used for transmitted light petrography.

### X-ray Powder Diffraction (XRD)

Powder diffraction patterns were acquired at the Central Analytical Facility (RAU) using a Philips PW 1710 X-ray diffractometer for qualitative identification of mineral phases. Samples were ground using a Siebtechnik disc-swing mill, and a tungsten carbide steel set and rings. Sample powders were used to produce side-loaded pellets. These were analyzed for a period of 55 minutes in a step-scan routine, with a  $2\theta$  angle range of  $5^{\circ}$  to  $80^{\circ}$ . Co- $K_{\alpha}$  radiation was used, generated at 40 kV and 30 mA. Data processing and mineral phase identification were controlled by the Bruker E.V.A. software package.

### Scanning Electron Microscopy (SEM)

A Jeol JSM-5600 scanning electron microscope was used for petrographic study of fine-grained samples and qualitative phase analysis. A 20mA electron beam generated at 15kV was used for this purpose. Back-scattered electron imaging was preferred for greatest compositional contrast.

### Electron Microprobe Analysis

Electron microprobe analysis was also carried out on selected minerals in fresh greenstone samples. These analyses were performed on a Cameca CAMEBAX 335 electron microprobe connected to a Link EXL EDS detector. Routine EDS spot analyses were performed at 15 kV and a beam current of 15mA, with a time constant of 70 seconds per spot analysis.