

individual drillholes obscures the trend; a simple regression least squares correlation is shown but  $R^2$  is too low to attach any real significance to it.

Rb/Sr isotope zoning. Rb/Sr isotope ratios readily distinguish altered and relatively unaltered rocks as defined by the Alteration Index. As noted by Gemmell primary values of this index for unaltered or weakly altered rocks are about 35.

With the exception of one altered footwall sample(L), these data show a weak correlation between Rb/Sr and Alteration index for both andesitic and felsic footwall rocks(Figure 5a). These data also define a linear relation between Rb/Sr and distance from the Hellyer deposit for altered rocks where the alteration index is greater than 40(Figure 5b) but less than values related to the intense stringer zone alteration(>55).

The same subset of data defined by  $AI > 40$  also show a stronger correlation with alteration index and distance for  $Sr_{initial}$ , 500 data(Figure 5 c and d) and indicate a depletion halo up to 2km in extent from the deposit.

Rb and Sr concentrations. The subset of more altered samples ( $AI > 40$ ) also directly permit recognition of Rb and Sr depletion haloes of 2km extent around the Hellyer deposit. As shown in Figure 6a, Sr concentrations are variable across the profile. Rubidium by contrast shows a systematic pattern consistent with alkali leaching and alteration(Figure 6c and d) and is far less variable than potassium(Figure 6 e and f) with respect to distance and alteration index(In the stringer zone itself rubidium correlates directly with potassium at the 96% level).

Rb/Sr concentration ratios are directly related to their isotopic ratio\* and therefore plot in a similar fashion(Figure 7a) again reflecting the dominance of potassium mass transfer during alteration and progressive increase in the number of available Rb exchange sites in sericite. This observation suggests that alteration mapping may proceed through the use of Rb/Sr concentration ratios using an alteration index filter to counter heterogenous alteration of host rocks in the distal parts of the alteration zone.

Figure 7b shows the variation of Rb/Sr downhole in drillhole HL306 which is *proximal* to the feeder zone of the ore body(data of Gemmell,1989). In this hole Rb/Sr ranges from 0.1 to 5.6 compared to a maximum of 2.27 in the proximal data set reported in Table 1. Similarly

\*  $^{87}Rb/^{86}Sr = (Rb/Sr)_{conc} [Ab^{87}Rb/Ab^{86}Sr] [WSr/WRb]$ , where  $^{87}Rb/^{86}Sr$  is the present day ratio as measured,  $Ab^{87}Rb$  and  $Ab^{86}Sr$  are the isotopic abundances of  $^{87}Rb$  and  $^{86}Sr$  respectively and  $WRb$  and  $WSr$  are the respective atomic weights.  $Ab^{86}Sr$  and  $WSr$  are calculated for each sample.