

4. Relationship Between Alteration and Mineralisation

The arrangement of zones is consistent with that suggested by Eastoe (1980-1981 Reports on Alteration Study to Mt. Lyell Mining and Railway Company Limited and Getty Oil Development Company) in that relatively unaltered rocks overlie the host horizon and relatively altered rocks lie beneath. Alteration in the immediate footwall is sericitic, and such alteration persists at most 300m into the hangingwall.

The pink and green altered rhyolites were further subdivided according to their degree of chloritisation. The following scale was used:

- 0 - no chlorite
- 1 - spots of chlorite (including hematite after chlorite)
- 2 - chlorite becoming pervasive, imparting a green colour
- 3 - intense chloritisation, dark green rock

The map shows the zone of intense chloritisation. It is pipe-like below the 1N workings, and is not closed to the east. In this area it is rich in pyrite and magnetite. It is sharply bounded northward. Southward, a lobe extends along-strike as far as line 26S. Less chloritised rhyolite caps the intensely chloritised zone except near the 1N and 1W adits where intensely chloritised lava extends up towards the quartz-sericite zone. The zone near the 1W adit may have been the feeder for the massive, stratiform sphalerite-rich lens intersected in DDH RH5. No stratiform mineralisation has yet been located above the zone enclosing the 1N adit. That zone is the more intensely mineralised and altered of the two, and appears to be the axis of the chloritic pipe. The zone of silicification is at its thickest where intersected by the axis of the pipe. Therefore in and immediately around the thick part of the silicified zone appears to be the most promising area for further stratiform sulphide deposits at Red Hills.

The silicified lavas in the knoll on the eastern section of 33S (about 200 to 250E) contain a little mineralisation. Quartz-siderite veins bear minor galena and pyrite, and a little sulphide occurs in the lava as well. The veins are folded and are probably Cambrian. It is suggested that this is a hot-spring deposit, not prospective for stratiform sulphides. It is overlain by relatively fresh volcanic rock immediately to the west.

The other main zone of silicification is enclosed by quartz-sericite alteration and overlies the black slate (lines 34S-40S). It appears to be conformable and may be related to the known massive sulphide lens in DDH RH5.

5. Discussion

The pipe (and lobe) of intense chloritisation imply a horizontal spreading of hot water at that level (at least 200-300m beneath the sea floor). At greater depths, around the deepest part of the pipe, water was already spreading sub-horizontally along small fractures, giving rise to the chlorite-pyrite-magnetite veins around the pipe. It is not evident what controlled this lateral spread.

Brecciation is characteristic of the centre of the pipe and lobe. It is secondary, and perhaps it could be due to boiling at the level of lateral spreading. The track from 16S, 630E to 14S, 700E provides continuous fresh exposure from pinkish-brown rhyolite with chloritic spots up to 5cm in diameter, through zones in which the spots coalesce, or