



Mineral Resources Tasmania

REPORT 1993/19

Report on visit to Victoria, Long Struggle and Linton Mines, and to White's Alluvial Workings, Mangana 30 June-1 July 1993

by R. H. Findlay

INTRODUCTION

Visits were made to the Victoria, Long Struggle and Linton mines, and to White's Alluvial Workings in order to assess the lessees' work in respect of their applications to renew their exploration licences. The visits allowed the collection of data useful to Mineral Resources Tasmania's NETGOLD project, and to the understanding of the North East Tasmania gold province.

LONG STRUGGLE/VICTORIA MINES (ALBERTON GOLDFIELD)

These mines occur on a lease held by Mr M. Bendall. The area has been covered by a detailed ground magnetic survey reported in restricted files 91-3210R and 92-3344R. The survey was supported by a three-day structural geological study and sampling programme by R. H. Findlay, who followed the grid lines of the magnetic survey. Findlay's report, in letter form, and map showing structural observations and sample localities are appended in file 91-3210R.

Victoria Mine

During my visit to the 2nd level adit of the Victoria Mine I viewed the limited exposed geology along the track, cut by M. Bendall, which follows the old bullock track used for cartage of spoil when the mines were operational.

The Victoria Mine would appear to be centred on the quartzite-rich core of an asymmetric antiform; the quartzite beds of the core are broken and fissured and M. Bendall has reported high Au values in chip samples from some of the quartz veins filling these fissures. One of these fissures takes the form of a sigmoidal tension fracture whose geometry is consistent with flexural flow in the fold limb; that is, this gold-bearing vein developed during folding. This suggests that the quartzitic beds in the fold core and limbs may be targets for exploration; the veining on the fold core is consistent with saddle reef development which will extend along the crest of the folds. Note that the folds in the Mathinna Beds show variable fold plunges, and that singly-hinged folds may give rise to multiply-hinged structures. That is, any saddle reefs in any one fold may

have a geometry unpredictable from the limited surface mapping possible. Drilling is required to test the potential of such a resource before mining proceeds.

Long Struggle Mine

The auriferous veins cut by the Long Struggle Mine occur in a different setting. Initially, the adit struck a veined crush-rock following a northeast trend; this had been stoped by previous miners. The adit turns to follow the trend of this crush zone, but appears to lose it after a few metres. The adit intersects several complex planar crack-seal veins of thicknesses between 1 and 15 centimetres. These veins display cross-cutting relationships. The adit ends in a planar crack-seal vein associated with arsenopyritic alteration in the country rock forming the hanging wall. Channel sampling is essential before mining proceeds.

LINTON MINE (FORESTER GOLDFIELD)

The mine, worked by Mr G. Fisher, lies on a ridge underlain by complexly faulted and veined Mathinna Beds. One of the lodes has been excavated, forming an open-cut face approximately 30 m long by 10 m high. This face follows the strike of a 15 cm thick quartz vein trending northeast. Also visible is an earlier reverse fault system dipping 45° to the southwest, and about 10-15 m east occurs a vertical NW-striking probably dextral fault. The NE-trending quartz vein and the NW-striking fault have been followed for gold by previous operators in the area. Also present are numerous fractures following the trend of the NE-trending auriferous quartz vein; no indications of movement were noted on the fracture faces.

The presence of both dextral and reverse faults suggests the possibility that dextral strike-slip faulting may control mineralisation. Figure 1 shows the idealised situation. Here, gold mineralisation could be expected to occur predominantly within the extensional fractures formed during dextral movement. The equal area lower hemisphere stereo net in Figure 1 shows the geometry of the structures at the Linton Mine. The great circle 1 gives the orientation of the dextral strike-slip fault, and great circle 2 the orientation of the reverse fault, the orientation

5 cm

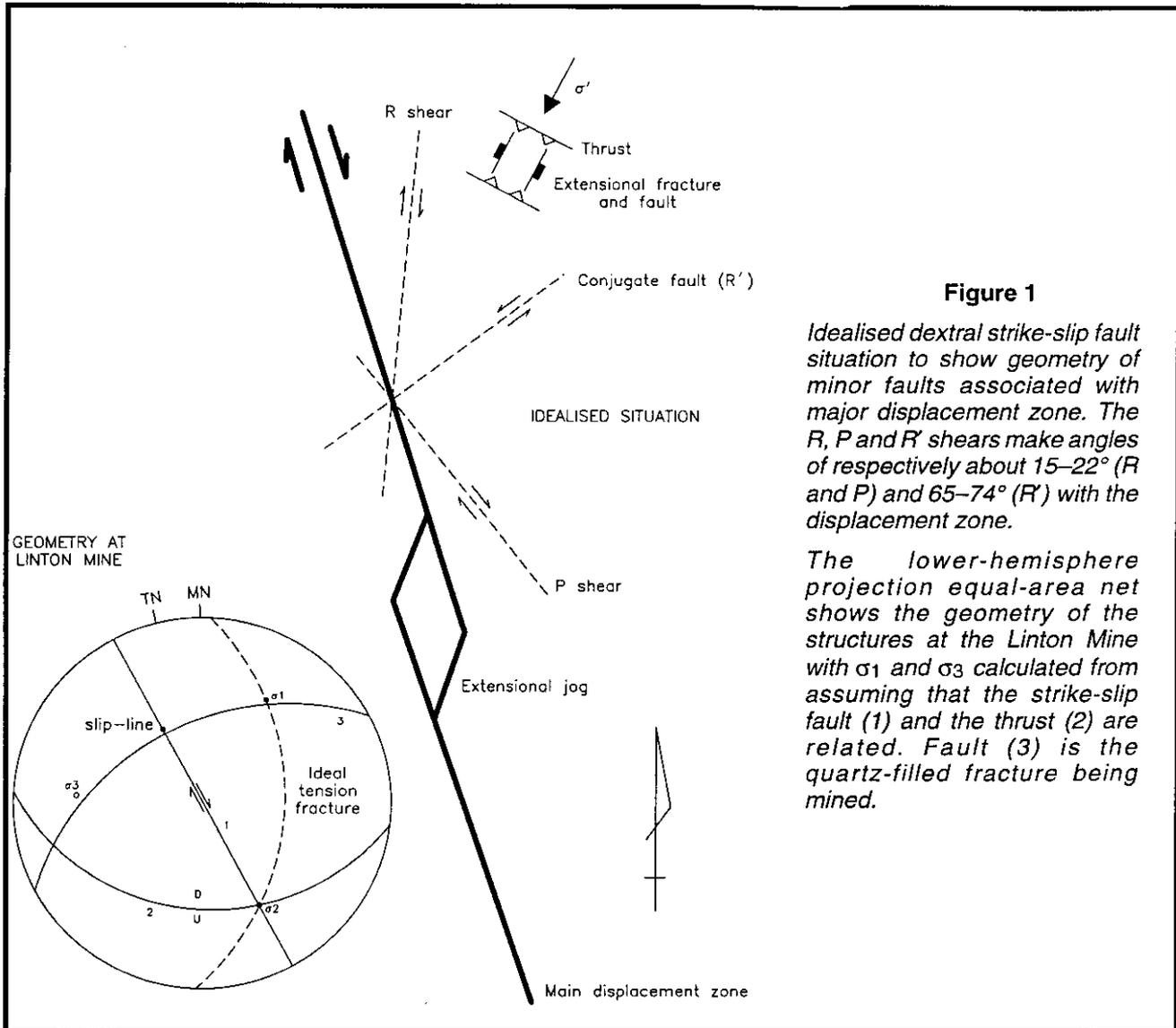


Figure 1

Idealised dextral strike-slip fault situation to show geometry of minor faults associated with major displacement zone. The R, P and R' shears make angles of respectively about 15–22° (R and P) and 65–74° (R') with the displacement zone.

The lower-hemisphere projection equal-area net shows the geometry of the structures at the Linton Mine with σ_1 and σ_3 calculated from assuming that the strike-slip fault (1) and the thrust (2) are related. Fault (3) is the quartz-filled fracture being mined.

of which is compatible with dextral strike slip. Great circle 3 is the orientation of the auriferous quartz vein trending northeast. The orientation of this is not that as shown in the idealised situation, and the fault 3 would appear unlikely to be related to dextral strike-slip faulting; indeed the σ_3 orientation derived from the strike-slip fault/thrust system is incompatible with fault 3 being an extensional fracture. Rather, σ_3 for fault 3 lies very close to σ_2 derived from the strike-slip fault/thrust system. This may be of kinematic significance in terms of complex history of faulting as the system moves from a strike-slip to extensional system with σ_1 constant, but the present data are too few to further this idea.

Given detailed mapping and drilling of the ground to determine the distribution and density of the fractures (particularly the payable NE-trending quartz veins), and support from a systematic Au-analysis programme, the mine could be developed readily as an open cut.

ALEC WHITE'S ALLUVIAL PROSPECT, MAJORS GULLY, MANGANA

This prospect is developed in alluvial deposits derived from the Mathinna Beds at Majors Gully, Mangana. The mine workings are well developed and Mr White is

supported by his two sons, one of whom has sound experience in economic geology and the other who is studying metallurgy. The work appears to be well organised using appropriate plant maintained in good order.

The principal target for mining here consists of red-weathering alluvium containing pyrite cubes to 10 mm across, together with wiry gold nuggets. I suggest (by analogy with the known lateritised Tertiary gravels of the Alberton-Ringarooma district) that the gold was deposited from solution passing through the gravel beds at Mangana during Tertiary times when lateritic weathering was common. The wiry form of the gold I was shown is totally inconsistent with its deposition as detrital grains.

The implications of this idea are considerable and render open to exploration all lateritised Tertiary sediments covering the Mathinna Beds of northeast Tasmania. The alluvial gold in any Quaternary deposits could well be reworked from these Tertiary deposits.

These considerations could not have been made without the knowledge I gained when mapping the Tertiary beds during the systematic 1:50 000 mapping of the Alberton Quadrangle, and emphasises the point that research

targeted on only one facet of the regional geology only need not necessarily bring the greatest benefit to exploration.

CONCLUSIONS

There are two conclusions arising from this work:

1. If the auriferous quartz veins in the Mathinna Beds are found as saddle reef fracture systems in fold hinges and sigmoidal tension gashes in fold limbs, as structures related to strike-slip faulting, and as fracture fillings in what may be NE-striking faults, then gold in northeast Tasmania could be occurring in structures of at least three different ages. In particular the multiple vein systems formed commonly during chevron folding, as occurs in the Mathinna Beds, will add a major complication to modelling the distribution of gold in these rocks.

However the restriction of the auriferous veins to the Mangana-Alberton lineament may still be indicative of

relatively simple structural control, such as a strike-slip fault system. Folding and thrusting occur commonly during strike-slip movement, and the folds in the region of the Victoria and Long Struggle mines are of the appropriate orientation for their production during dextral strike-slip faulting. Alternatively the folds here may represent the regional northwest-trending structures which have been tightened during strike-slip faulting. This would generate voids in the fold crests and also probably fractures in the fold limbs.

2. The presence of wiry gold nuggets in red-weathered alluvial deposits at one locality suggests the likelihood of the precipitation of gold from solution during the Tertiary lateritisation event; this idea requires testing by systematic investigation with an emphasis on mapping and sampling the Tertiary deposits of northeast Tasmania.

[4 August 1993]