TR18_10_13

1. The Devonport gold mine, Black Bluff.

P.L.F. Collins

The Devonport gold mine is situated approximately 6 km west of Moina on the Devonport Creek, which flows south-east into the Lea River [48/005919]. The mine is readily accessible by a rough vehicular track which leaves the gravel road about 10 km south of Nietta and extends over the Black Bluff Range. The last one kilometre of the track, on the top of the range, is deeply washed out. An alternative route, 8 km long, is by vehicle track and then pack track directly from Moina.

PREVIOUS LITERATURE

The first report on the mine was made by Twelvetrees (1913) after examining the initial development trenches excavated by the Devonport Prospecting Association. Twelvetrees describes a discontinuous series of quartz and gossanous formations, and suggests the encouraging gold assays obtained in surface outcrops were the result of secondary enrichment and could not be expected at depth.

Similar conclusions were later reached by Broadhurst (1934), and by Henderson (1939) when the mine was held under an application for a mining lease by G.D. Gardner.

GEOLOGY

The mine is situated at the faulted boundary of the Roland Conglomerate and the Moina Sandstone, both of Ordovician age. The NNW-trending fault downthrows the sandstone on the eastern side, against the conglomerate to the west. The strike of both formations is approximately N-S with a steep easterly dip (Henderson, 1939).

The Moina Sandstone (specimens 73-324*, 73-325) occurs as a massive, fine-grained, light-grey quartzite consisting of 80-90% angular quartz grains, averaging 0.1 mm across, with an interstitial matrix of chert, limonite and sericite. The Roland Conglomerate comprises a thickly bedded sequence of hematitic pebble conglomerate and sandstone. The conglomerate exposed at the end of the adit (73-326) and in the open cut (73-327) consists of approximately 50% sub-angular lithic fragments in a siliceous matrix.

Broadhurst (1934) indicated that the faulting occurred as a number of small irregular fissures instead of a single fracture, and that these fissures formed at two different periods as one set is filled with quartz and the other with pyritic material, which gives rise to the surface gossanous lodes when oxidised. A shear zone approximately 1.5 m wide and striking 165°m occurs 38 m from the entrance to the adit (fig. 2). This zone consists of black shaly material and brecciated and weathered host rock, and may represent one of the fissures filled with pyritic material.

ECONOMIC GEOLOGY

Mine workings

The workings comprise an adit, a small open cut and several small trenches; all on the western slopes above Devonport Creek (fig. 2). The open cut, approximately 6 m long, 10 m wide and 3-4 m deep, with a 10 m long

*Detailed descriptions of the specimens referred to in the text are given in Appendix 1. Specimen locations are shown in Figure 2.

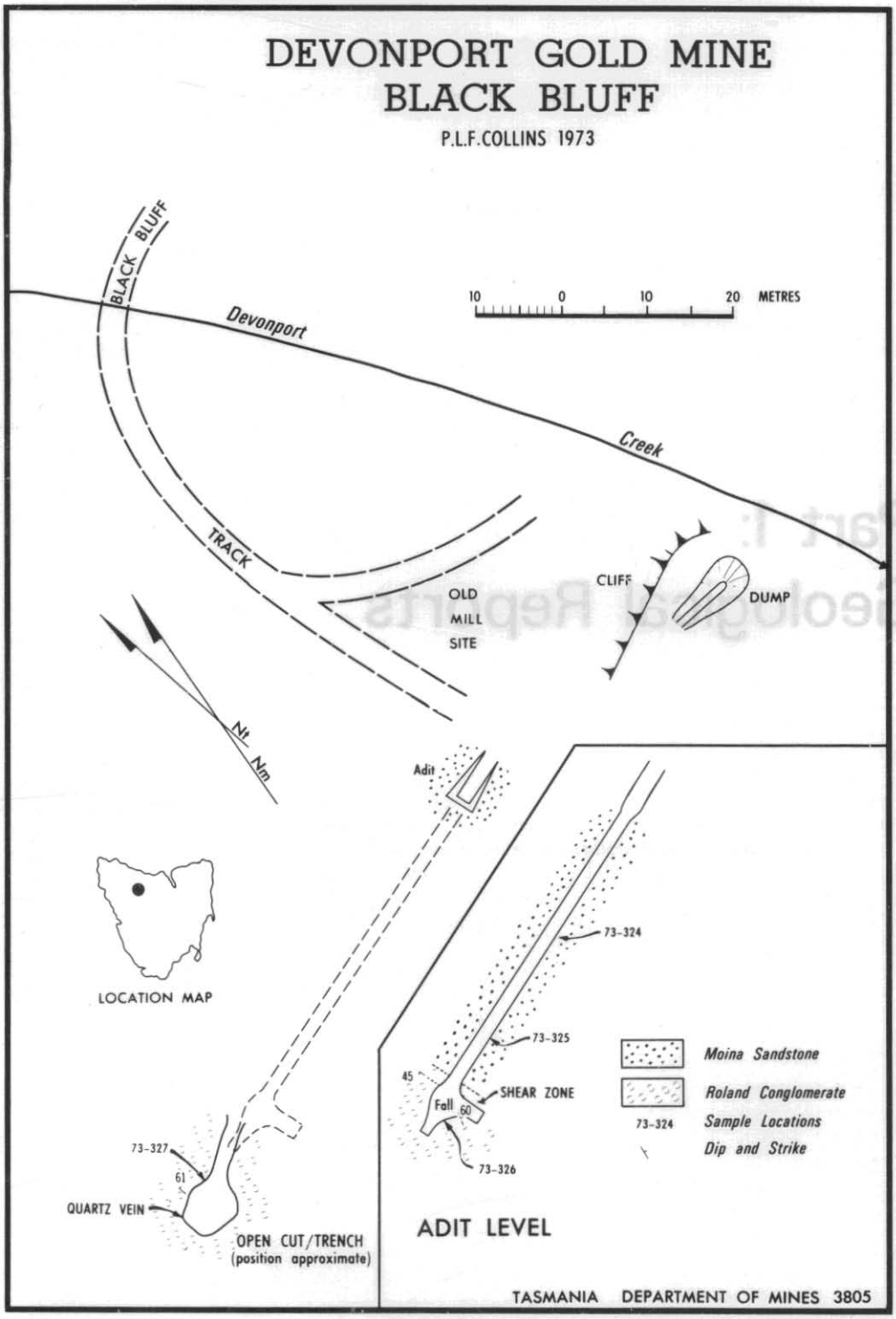
5 cm
DEVONPORT GOLD MINE
BLACK BLUFF
P.L.F.COLLINS 1973
BLACK BLUFF
Devonport
Creek
10 0 10 20 METRES
TRACK
OLD MILL SITE
CLIFF
DUMP
Nt
Nm
Adit
LOCATION MAP
73-324
73-325
45
Fall
60
SHEAR ZONE
73-326
73-327
61
QUARTZ VEIN
OPEN CUT/TRENCH
(position approximate)
Moina Sandstone
Roland Conglomerate
73-324
Sample Locations
Dip and Strike
ADIT LEVEL
TASMANIA DEPARTMENT OF MINES 3805

Figure 2.

trench leading into it, is about 25 m above the adit; whilst below the adit are the dilapidated remains of a small mill and rusting machinery.

The adit has been driven approximately 44 m on a bearing of 250°m, with a south cross cut, 4 m in length, at 39 m. Broadhurst (1934) also reports a northern branch of the tunnel, but this may have since been boarded up. A fall associated with rotten timbers has occurred at 37-39 m, and from here to the end of the tunnel the roof is unstable.

Mineralisation

The gold occurs in a series of short lenses of quartz which have filled an anastomosing system of fractures associated with the major fault zone. Henderson (1939) reports the quartz veins to be sub-parallel to the bedding with a slightly shallower dip than the country rock, and as being difficult to trace.

Assays of samples collected by Henderson (1939) from surface gossan and lode quartz and underground lode quartz, reproduced in Table 1, indicate a possible enrichment of gold in the ferruginous lodes and a decrease in gold values with depth, as originally suggested by Twelvetrees (1913). This surface enrichment, particularly in the gossanous formations, is attributed to the liberation of gold during decomposition of pyrite.

Table 1. ASSAYS OF SAMPLES FROM THE DEVONPORT GOLD MINE (FROM HENDERSON, 1939).

Sample No.	Reg. No.	Au (g/t*)	Ag (g/t*)
1	1056	18.94	3.00
2	1057	11.16	2.36
3	1058	1.53	1.15
4	1059	0.00	0.00
5	1060	9.57	3.38

Sample 1: gossanous material, south wall of open cut.
2: lode quartz, north wall of open cut.
3: gossanous formation, trench north of open cut.
4: face at south end of adit.
5: lode quartz, adit.

*1 gram/tonne = 0.65 dwt/ton.

CONCLUSIONS

Associated with the faulting of an extremely brittle host rock, a system of narrow fractures developed, which resulted in an erratically distributed series of short lenses containing quartz, pyrite and small amounts of gold and silver.

Although the encouraging gold assays obtained from surface outcrop appear to diminish with depth, the irregular nature of the quartz lenses is the main deterrent to the mining of the deposits.

REFERENCES

BROADHURST, E. 1934. Report on the Stormont, Bell Mount and Black Bluff district. *Unpubl.Rep.Dep.Mines Tasm.* 1934:32-45.

HENDERSON, Q.J. 1939. Departmental report on the Devonport mine, Black Bluff. *Unpubl.Rep.Dep.Mines Tasm.* 1939:61-64.

TWELVETREES, W.H. 1913. The Middlesex and Mount Claude mining field. *Bull. geol.Surv.Tasm.* 14 (pp. 112-113).

APPENDIX 1

Petrographic descriptions of host rock samples collected from the Devonport gold mine.

73-324. Adit, 17 m from portal. Quartzite.

The rock is fine-grained, light grey to pale pink in hand specimen, with no apparent bedding or lamination. In thin section it consists predominantly of angular - sub-rounded quartz fragments, and minor sub-rounded chert grains, ranging from 0.05-0.4 mm and averaging 0.1 mm across. There is no apparent orientation of the quartz grains, which have very irregular boundaries. The grains form a mosaic with a little siliceous and ferruginous cement, and an intergranular matrix of quartz, sericite and limonite. The quartz grains comprise 80-85% of the rock, chert grains 5%, and matrix 10-15%.

73-325. Adit, 31 m from portal. Quartzite.

The rock is very similar to specimen 73-324, but the angular quartz grains are more closely packed, comprising up to 90% of the rock with an interstitial matrix (10%) of chert, limonite and sericite, and a siliceous and ferruginous cement. The quartz grains range from 0.02-0.3 mm and average 0.05-0.1 mm across.

73-326. Adit, 40 m from portal. Pebble conglomerate.

The purple-red coloured hand specimen consists of sub-angular to sub-rounded lithic fragments (about 50% of rock) in a siliceous matrix. The rock is poorly sorted with an open framework, and there is no distinct linearity of the lithic fragments which are 0.5-5 mm across and average 2 mm across. In thin section the rock consists of angular lithic fragments set in a matrix of quartz grains (0.01-0.5 mm in diameter) with interstitial hematite and sericite. The grain boundaries are often highlighted by the hematite. The lithic fragments consist of about 30% hematitic chert, 10% rounded siltstone and 10% quartzite with the matrix making up the remaining 50% of the rock.

73-327. Open cut, north wall. Pebble conglomerate.

The pink-red coloured rock consists of 40% sub-angular - rounded, often oblate, rock fragments 0.5-10 mm long although averaging 2-3 mm in length, set in a fine-grained quartz matrix. The rock has an open framework, and the lithic fragments have a preferred orientation parallel to the bedding surfaces as noted in the field. In thin section, the poorly sorted rock consists of 20% hematitic chert, 15% siltstone and fine sandstone fragments, and 5% quartzite fragments, all averaging 2.5 mm x 1 mm, and set in a matrix (60%) of fine quartz grains cemented by iron oxides.

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