1980/20. Cranes tin prospect, Upper Natone.

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Abstract

A N-S trending tongue of Tertiary basalt defines the probable course of a deep lead occuring in a pre-existing valley in Devonian granite. Tin-bearing gravels overlying the granite have been worked along the western edge of the basalt tongue but the main gutter of the lead is probably located to the east of these sluiced workings towards the centre of the tongue of basalt.

The amount of overburden to be removed would probably preclude a viable sluicing operation.

INTRODUCTION

Cranes tin prospect is situated in the valley of Osborne Creek (previously known as Falls Creek) on the northern flank of Aitkens Hill [DQ028326]. The prospect is located within 61.9 ha of freehold land in the name of A. Crane and is covered by mineral lease 496P/M, of which the owner is the lessee. The lease is located on the northern side of the Upper Natone Road, approximately 6 km south-west of Upper Natone (fig. 1).

HISTORY AND PREVIOUS LITERATURE

Early reports dealing with mineral deposits in the Upper Natone area (Montgomery, 1896; Blake, 1936) mention prospecting for stream tin to the north-west of Mt Housetop in tributaries of the Emu River, principally in the headwaters of Tittie Gee Creek (previously called Trial Creek) and Osborne Creek. Blake (1958) undertook a survey of the prospect in 1957 and recommended drilling to define the course of a N-S trending sub-basalt deep lead. Two percussion drill holes apparently have been drilled by the Department of Mines subsequent to Blake's visit.

The early history of the area is described by Blake (1958). Prospecting by A. Crane began in about 1953 and has consisted of intermittently working tin bearing sub-basalt gravels which are exposed to a limited extend around the denuded edge of basalt flows.

PRODUCTION

Total production from the lease is 353.58 kg of tin concentrate containing 201.51 kg of tin metal (table 1). Production during 1956 - 1960 was mainly from the sluiced area north of the shaft and in 1980 from the sluiced area towards the southern boundary of the lease.

GENERAL GEOLOGY

The basement rocks of the district consist of uniformly medium-grained adamellite of the Devonian Housetop Granite Batholith (Gee, 1977). Porphyritic and aplitic variations of the normal granite occur, with tin-bearing greisen veins traversing the aplites (Blake, 1958).

An extensive cover of Tertiary basalt blankets much of the granite (fig. 1). The basalt flows filled pre-existing valleys, and in places alluvial deposits, occurring along the course of former streams, underlie

Table 1. TIN PRODUCTION FROM CRANES TIN PROSPECT, UPPER NATONE.

Date	Sn(conc.) (kg)	Sn assay (mass%)
July 1956	56.70	73.8
July 1956	44.45	46.0 Cassiterite-quartz
October 1956	30.39	42.0 Cassiterite-quartz
March 1958	53.52	72.0
March 1959	88.90	59.0
December 1960	27.22	32.5
March 1980	52.4	68.0 (assigned)

the basalt. The course of a probable deep lead was identified by Blake (1958) as extending in a north-south direction, approximately through the centre of the lease (fig. 1).

THE PROSPECT

There are several workings scattered about the lease, but most of the prospecting, sluicing and production has been carried out and derived from along the western boundary of the N-S trending tongue of Tertiary basalt (fig. 1).

In the south-east corner of the lease is a small pit or shaft (fig. 1) which has been excavated in partially decomposed, altered, aplitic granite containing tourmaline - rich stringers. The stringers impart a foliation which trends 210° and dips 75° W. The altered granite here has assayed 0.53 and 0.58 mass% Sn.

In the north-eastern part of the lease is a zone of dark green tourmaline-rich rock, trending approximately 205°.

In the creek flowing west from the eastern boundary of the lease and into Osborne Creek, preparations are in progress for sluicing the alluvial sediments in the creek bed.

Most of the mining on the lease has been undertaken in an open cleared area along the western edge of the northerly trending tongue of basalt, beneath which is a probable deep lead (fig. 1). Apart from a shaft, all the mining has been by sluicing, and all the tin produced from the lease has come from this area. There are two sluiced areas, one to the north of the shaft and the other in the small tributary of Osborne Creek (fig. 1). Cassiterite has been recovered from both the sluiced workings.

The northern sluiced area is overgrown and partially filled in, but from Blake's (1958) description of a prospecting cut at this locality, granite is overlain by 0.6 - 1.2 m of clay, grit and quartz gravel containing a small amount of medium— to fine-grained cassiterite. Quartz in the gravel also contains cassiterite crystals. The sediments are covered by partly decomposed basalt and basalt-derived clay. The granite bottom is uneven but dips to the east at a low angle, and alluvial gravel overlying the granite is only slightly waterworn, indicating a close proximity to the source (Blake, 1958). The sluiced cut is 40 - 50 m in length, widening at the southern end, and trends approximately 140°. On the western side of the cut, just above the floor, weathered,

decomposed greisenised granite is exposed. Here there is a probable fault trending approximately 160° and filled with quartz. The granite adjacent to the fault was later altered to a quartz-tourmaline greisen carrying cassiterite.

Approximately 20 m south of the sluiced cut, a shaft has been sunk to a depth of about 12 m in weathered basalt without penetrating the underlying wash. The sinking of this shaft was assisted by the Department of Mines under the Aid to Mining Act.

Several holes were reported to have been drilled vertically into the basalt to depths of 15 - 30 m, along a north-south line between the shaft and the southern boundary of the lease. Of the six holes drilled, none penetrated the sediments or granite, but four were reported to have stopped in a clayey pug. One of the holes was collared 14 m south of the shaft and was drilled to a depth of 21 m through weathered basalt before being stopped by pug.

In the small tributary of Osborne Creek, the banks of the creek have been sluiced where it has dissected the basalt. Again, the workings are overgrown and much of the western wall has collapsed, but the uneven granite/basalt interface is exposed along the eastern wall and has a general trend of about 180°, dipping about 40°E.

Subsequent to Blake's (1958) report, two percussion holes were drilled by the Department of Mines on the flat, open area to the north-east of the northern sluiced area. There is no record of the results of this drilling, which was apparently undertaken in the summer of 1959-1960. The collar of one of these holes is still marked and Mr Crane reports this hole was drilled to a depth of about 27 m through basalt, and bottomed in granite.

CONCLUSIONS

A north-south trending tongue of Tertiary basalt at least 30 m in thickness defines the probable course of a sub-basalt deep lead, resting upon a bedrock of Devonian granite. Within the granite are tin-bearing greisenised and tourmaline rich zones. Tin-bearing gravels overlying the granite have been worked along the western edge of the basalt tongue. As previously concluded by Blake (1958), the main gutter of the lead would probably be located to the east of the present sluiced workings towards the centre of the basalt tongue, and it is along this gutter that richer tin-bearing sediments would be expected to occur.

Any further effective exploration of the prospect would best be undertaken by drilling a series of holes across the lead to locate the gutter and determine the size, depth and grade of the lead. This drilling would also provide information on the thickness and hardness of the basalt overburden.

However, even if the presence of tin-bearing sediments was indicated by drilling, the amount of overburden which would need to be removed to allow sluicing of sediments in the main gutter, may preclude an economically viable mining operation. As a guide to the amount of overburden present it may be assumed that the basalt filled a V-shaped valley 600 m in length (through the lease), 30 m in depth (minimum estimate) and an average of 120 m in width. Tertiary basalt has a density of about 3.0 t/m^3 but as the basalt is weathered near the surface an average density of

2.5 t/m^3 is probably more realistic. Using these figures it is estimated that there is about 1.08 million $metres^3$ or 2.7 million tonnes of basalt overburden.

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[30 June 1980]

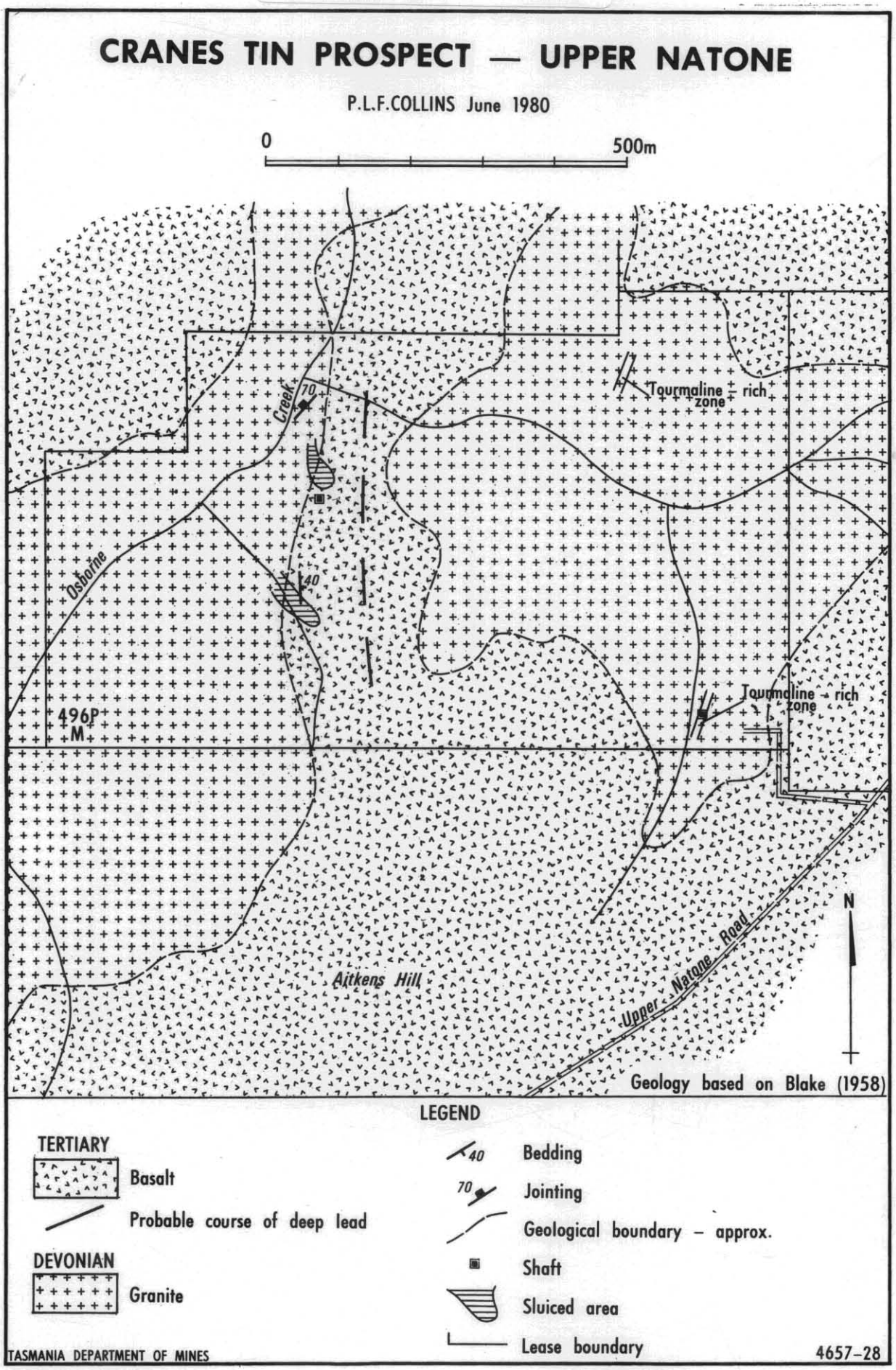
5 cm
CRANES TIN PROSPECT — UPPER NATONE
P.L.F.COLLINS June 1980
0
500m
Tourmaline - rich zone
Tourmaline - rich zone
Osborne Creek
70
40
496P
M
Aitkens Hill
Upper Natone Road
N
Geology based on Blake (1958)
LEGEND
TERTIARY
Basalt
Probable course of deep lead
DEVONIAN
Granite
40 Bedding
70 Jointing
Geological boundary – approx.
Shaft
Sluiced area
Lease boundary
TASMANIA DEPARTMENT OF MINES
4657-28

Figure 1