

1983/55. Basalt reserves on Kapai Hill, north-east Tasmania

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Abstract

Basalt caps an area of about 11.8 ha on Kapai Hill. A Hydro-Electric Commission power line reservation, roads, and Forestry Commission plantations limit the available extraction area to only about 0.4 ha containing approximately 49 000 m³ of broken stone.

INTRODUCTION

Kapai Hill [EQ572427] lies in State Forest about 14 km due east and about 25 km by road from Scottsdale. A Tertiary basalt residual caps the hill, a power transmission line passes near the summit, and a Lands Department Trigonometrical Station is situated south of the power line.

Both the Forestry Commission and a contractor, G. Gerke of Scottsdale, extract stone for road making from a quarry near the hilltop. Mr Gerke recently requested additional quantities of stone from this site to supply the Australian National Railways Commission with ballast.

BASALT RESERVE

The total area occupied by basalt is approximately delineated by the 430 m contour, which encloses an area of about 11.8 ha. The thickness of the basalt, as indicated by the contour map (Forestry Commission Plantation Series, Scottsdale 5444-8) is 10 m. For reserve estimation purposes, a 30% reduction has been made to allow for depth of weathering, variations in quality, variations in configuration of the base, and inaccuracies in locating the true boundaries of the basalt which are covered by basalt scree and weathering products.

One hectare is therefore assumed to contain 70 000 m³ of basalt which would yield 122 500 m³ of broken stone (expansion factor of 75%).

MINING CONSTRAINTS

- (1) The Hydro-Electric Commission places a 150 m reservation on mining in proximity to transmission lines. There is therefore a 300 m strip through the area which is unavailable. This covers 6.1 ha.
- (2) The north-eastern portion of the area is traversed by a road and is under plantation and so is excluded from the reserve. This area comprises 2.1 ha.
- (3) Pine plantations north and south of the H.E.C. reserved zone cover 2.5 ha and 0.7 ha respectively. Stone from these areas would presumably be available at a later date but should be excluded in the present estimation. This area comprises 3.2 ha.

The above areas comprise about 11.4 ha, leaving 0.4 ha of the total area available for extraction. This area is estimated to yield 0.4 x 122 500 m³ or 49 000 m³.

It may be possible to negotiate a smaller exclusion zone with the H.E.C. but damage to power lines and destruction of trees by previous

quarry operations would indicate that 150 m is a minimum requirement.

RAILWAY BALLAST SPECIFICATIONS

Tenders were recently invited by the Australian National Railways Commission for the supply of 50 000 m³ of crushed stone in the size range 6 mm - 51 mm ($\frac{1}{4}$ "-2"). The stone was not required over 3 years as reported by Mr Gerke, but in a few months and it is likely that substantially bigger rock blasts would therefore be required than envisaged by the Forestry Commission.

It is pertinent also to note that the minimum size for the contract was 6 mm ($\frac{1}{4}$ "), not the 16 mm ($\frac{5}{8}$ ") reported by Mr Gerke. The relevance of this point is that the Forestry Commission was to obtain, free of charge, the undersized material, reckoned by Mr Gerke to be 20 000 m³ or about 28% of the mined product. The 6 mm fraction is unlikely to exceed 15% of the total and is also much less attractive as a surfacing gravel.

CONCLUSION

The currently available basalt on Kapai Hill for quarrying purposes is limited to the 0.4 ha strip of unplanted area on the north side of the H.E.C. exclusion zone (fig. 1). This is expected to yield about 49 000 m³ of broken stone. It is not considered advisable to extend the use of this limited resource to private contractors.

The current quarry site is located on the southern boundary of the exclusion zone and must therefore be considered to have an extremely limited life.

The quality and durability of the stone and particle size distribution of the quarry products and screening products were not examined in this investigation.

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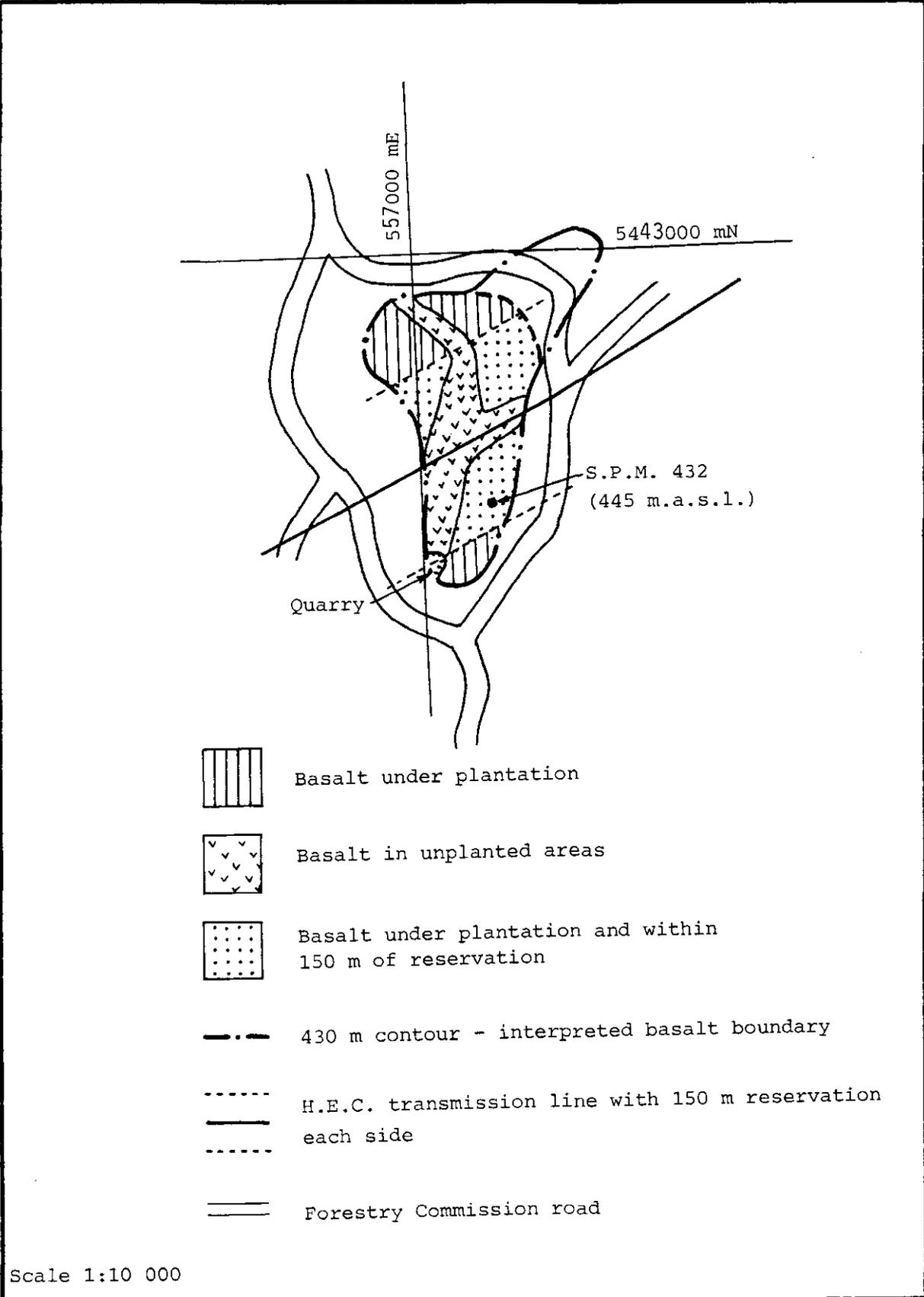


Figure 1. Kapai Hill basalt area.

