

1977/38. Seismic survey, Sandfly quarry site.

D.E. Leaman

Hazell Brothers of Margate are investigating the possibility of opening a quarry on the gentle south-west facing slope above Mafeking Creek, about 1.5 km south of the Leslie Road. Relief in the area [EN200412] is generally less than 10 m and is strongly related to a dolerite-mudstone/sandstone boundary. The roof of a thick dolerite sheet is exposed to the south and large, planar slabs of fine-grained dolerite crop out. On the northern section of the property, Permian rocks crop out and a steepening in surface slope correlates with the margin of the Permian cover. The Permian rocks show evidence of thermal metamorphism.

Several bore holes have been drilled on the site and one test excavation made. Good quality rock was encountered in each hole at shallow depth. A limited seismic survey was undertaken in order to correlate this data as well as to generate some evaluation of the volume of good material. Two spreads were fired near the foot of the slope from the Permian cover and across this slope, in order to assess the state of the dolerite underlying the Permian cover. The cover material was also examined.

RESULTS OF SEISMIC SPREADS

Spread 1. This spread was laid on nearly level ground across the slope foot with some Permian derived soil at the eastern end. Dolerite was exposed to the west. The observed time-distance profiles were complex due to the slight surface variations, the wedging lithologies and the very high velocities noted. Velocity values for dolerite were 3300-6000 m/s.

These values indicate that there is very little Permian cover and that it is very weathered or fractured. The soil cover is also very thin (>1 m, 1000 m/s) but variable. The thickness of overburden (velocities less than 5000 m/s) never exceeds 4 m.

Spread 2. This spread was laid across the bulge of the slope with the eastern end of the spread near its foot. The eastern shot points were common to both spreads. The time-distance profiles were highly asymmetric; those from the east reflecting the dolerite and those from the west the Permian cover.

Velocity values for dolerite were 4500-6000 m/s while those recorded for Permian were 1600-2800 m/s.

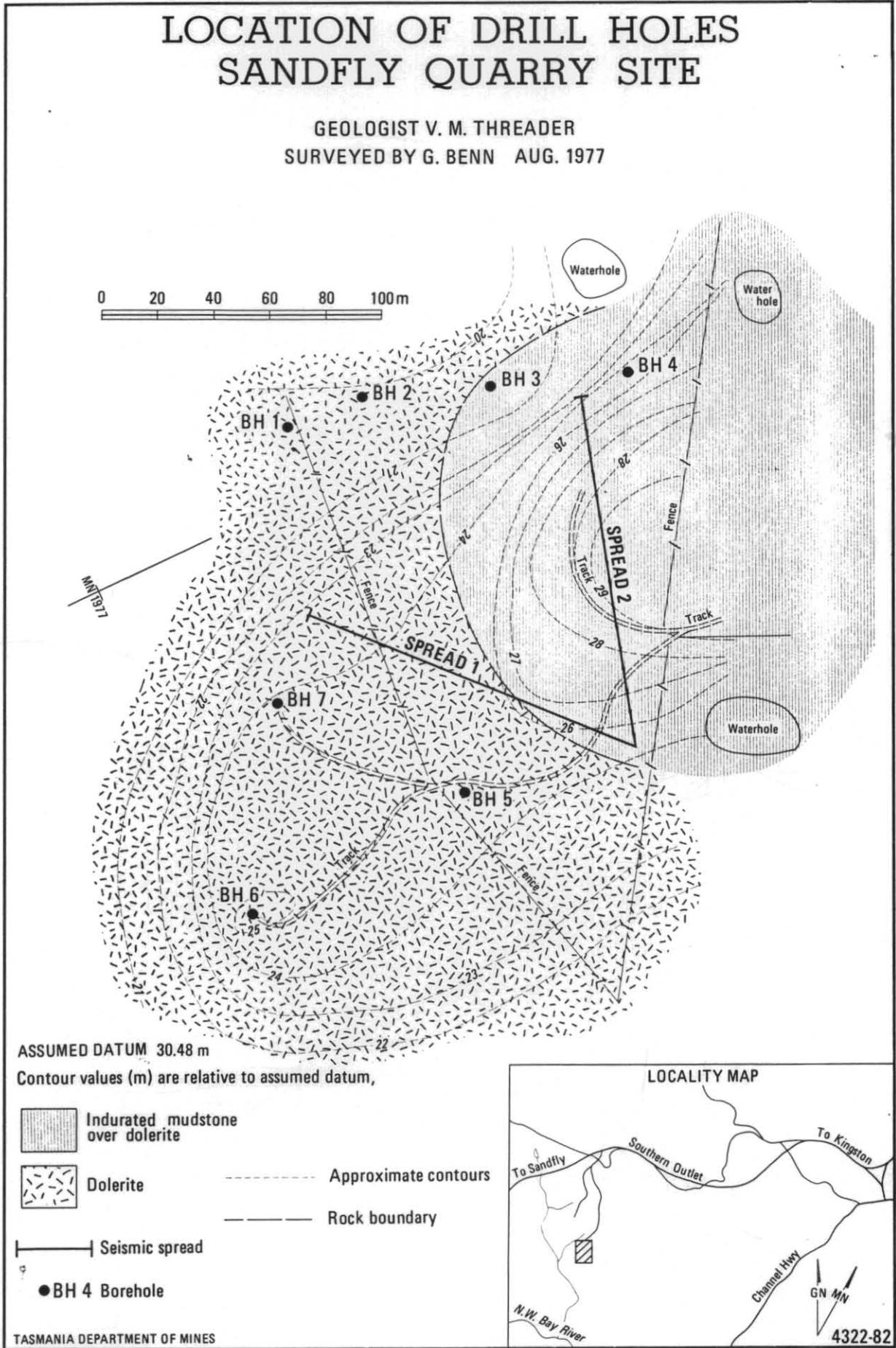
Due to the complexity of the profiles only estimates may be given of material thicknesses. The soil is again variable and thin (~1 m) but the Permian cover ranges from 1-8 m in thickness.

The velocity values observed for the Permian cover indicates that it is composed of weathered or shattered rock and could generally be rippable. The dolerite underlies it directly and there is no evidence of significant weathering. The velocity values recorded indicate that it is fresh and massive.

[31 August 1977]

LOCATION OF DRILL HOLES SANDFLY QUARRY SITE

GEOLOGIST V. M. THREADER
SURVEYED BY G. BENN AUG. 1977



ASSUMED DATUM 30.48 m

Contour values (m) are relative to assumed datum,

-  Indurated mudstone over dolerite
-  Dolerite
-  Approximate contours
-  Rock boundary
-  Seismic spread
-  BH 4 Borehole

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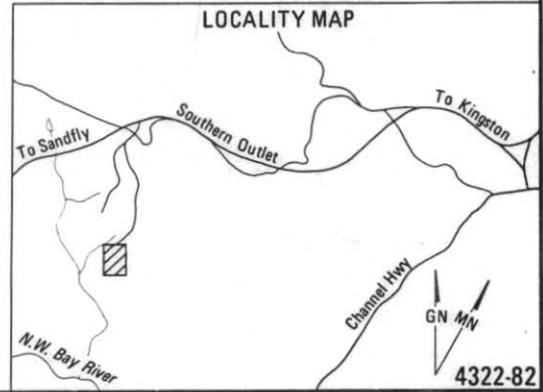


Figure 1

5 cm

APPENDIX 1

Estimate of reserves

V.M. Threader

The area consists of a gently sloping dolerite surface capped on the north side by indurated Permian sandstone. The slope increases in the south, south-east and south-west towards Mafeking Creek and its tributaries.

Seven percussion holes were drilled (Fig. 1) and the chips examined. The depth of weathering is only a few centimetres. The fresh rock is fine grained and lightly coloured. The holes were limited to 7.62 m (25 ft.) due to the presence of groundwater at that depth. It is possible that a coarser grained rock will be encountered at a greater depth and that only the chilled margin has been examined.

The area can be expected to yield a good quality, tough dolerite but it may be necessary to establish a working face further to the south, south-east or south-west where steeper slopes would permit a more practicable thickness.

The area examined would yield in excess of 1 million tonnes per 10 m depth and the indurated sandstone cover would contain around 50 000 m³ south of the fence line, of base coarse material for road making.

[7 October 1977]