

REPORT ON FUTURE DRILLING POLICY AT BUTLERS GORGE DAMSITE

Drilling is at present proceeding on behalf of the Hydro-Electric Commission, with the aid of two Mines Department diamond drills, in connection with a proposed dam site at Butlers Gorge on the Derwent River.

The site is  $10\frac{1}{2}$  miles west of Tarraleah power station from which it is reached by way of a road generally following the canal, on the north side.

The gorge has been eroded in solid diabase and this rock outcrops in river bed along the length of that portion of the valley. Near the northern end of the gorge, scrub and trees have been cleared on both sides of the river, over a length of approximately 10 chains, thus enabling outcrops to be observed with ease.

Diabase outcrops boldly up the greater part of the steep hillsides above either bank of the river, but is more conspicuous on the western fall. On the eastern side diabase detritus and boulders occur in places but do not extend below a depth of 10 feet, as shown in road cuttings and trenches. On this side also, at 50 feet above the river, beds of Pleistocene gravels with a maximum thickness of 10 feet are exposed in a trench near the northern edge of clearing. The gravels are not extensive and solid diabase outcrops at surface within two chains on either side of the trench. The diabase is an extremely hard and homogeneous rock which resists the effects of weathering and erosion to a marked degree and is, therefore, pre-eminently suitable for dam construction. This rock is impervious to water but jointing is present, which would allow the passage of some water to shallow depths.

The main system of joint-planes is nearly vertical and often occurs in prismatic form combined with long parallel jointing at frequent intervals. Horizontal jointing is less conspicuous and occurs at much greater intervals.

To date, 4 bore holes have been drilled on the eastern hillside in no systematic manner of location. Number 2 and 3 bores are situated a few feet above river level and several chains apart, while numbers 1 and 4 are sited approximately 100 feet higher up the slope.

Bores number 2 and 3 entered solid diabase from surface, and number 4 bore at 3 feet below, after passing through boulders and clay. Number 1 bore passed through boulders, clay and rubble for the first 22 feet from surface before entering solid rock. All the bores continued to the full depths of 85, 77, 44 and 216 feet respectively, in solid diabase. Examination of the drill cores indicates that slight weathering effects extend along partly open joint planes to depth varying from 15 to 30 feet. Thereafter the jointing appears to be closed and no decomposition is visible. Below the depths quoted minute calcite veining, evidently filling joint planes, were encountered at intervals.

The drilling, so far, has given general information with respect to the solid nature of the diabase and the inconsiderable weathering effects along joint planes. As generally similar conditions are to be expected elsewhere in the diabase any further drilling should be confined to a definite plan.

It is therefore recommended that the most favourable position for the dam wall and abutments, with regard to topographical features and the type of dam to be constructed, be ascertained. It should then only be necessary to drill one or possibly two lines of bores across the valley at that point instead of continuing with the scout bores as at present.

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(3) Main shaft sunk to a depth of 100 feet and being an enlargement of the shaft at the bottom. Located 100 feet northwesterly from the top of the shaft and 6 feet higher at bottom.