

Investigation of the geology of an area of land near Penguin

by P. C. Stevenson

The Department of Mines was requested by the Land Valuation Branch of the Treasury to examine a piece of land, area 9 acres 1 rood 20 perches, that has to be acquired from Mr W. A. Barker for the Ulverstone–Penguin Highway. The geology of the area is of significance because of the difficulty in finding suitable water storage sites.

In the area in question, Myrtle Creek, before diversion, flowed in a valley about 120 feet deep from stream bed to the immediate hill crests and about half a mile wide. These crests are formed of weathered basalt which has given rise to the valuable red soil of the district. The basalt overlies soft Tertiary sand and clay which are, as normal, poorly exposed, having been obscured by the red soil washing down from the upper slopes.

The floor of the valley can be assumed to consist of Tertiary sand and clay similar to that on the valley sides, although at several places hard outcrops of consolidated Cambrian rocks rise up through them.

Myrtle Creek, before diversion, ran not on the solid Tertiary floor rocks of the valley, but on a deposit of Quaternary gravel, sand and subsidiary clay which lines the valley floor to a depth of up to 16 feet. This gravel and sand has been exposed in numerous pits and bores and also in the beds of the natural and diverted creeks.

The hydraulic permeability of the different rocks is the property that determines the suitability of a particular site for surface water storage. In particular it can be taken as proven that some sand layers in the Tertiary rocks have been shown to be permeable by the leakage of the existing dam. The sand and gravel of the valley floor contain little or no clay material and are highly permeable, and therefore unsuitable as a site for a surface dam. They would require that a cut-off wall as deep or deeper than the gravel would need to be formed around any proposed dam on them. Paradoxically the gravel, although unsuitable for surface storage, constitutes an underground water storage of considerable volume which has been revealed by the pitting, but has never been subjected to pump testing. This testing must be regarded as an essential before the underground storage potential of the area is assumed.

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