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Section 4 — Underground Water

17. UNDERGROUND WATER PROSPECTS — TARLETON

by W. L. Matthews

The prospects for underground water for irrigation purposes on Mr D. H. Harrison's property at Tarleton have been investigated. Good flows of artesian water were obtained at Ayers' Bore, 2 miles W of Tarleton in 1963. (W. L. Matthews Tech. Rep. 8).

Near the Mersey River estuary the present flood plain is underlain by clay. Further away from the river there is a terrace about a mile wide 30 to 40 feet above the flood plain. Exposures in a quarry at the edge of the terrace suggest that gravel, sand and clay underlie the terrace. On the surface the soil is mostly clay or silt but there are also some areas of gravel.

South of the terrace the land surface rises and is underlain by Permian rocks which have a general N dip according to mapping by Reid (1924), Jennings (1959) and Burns (1964). In the Devonport Quadrangle Burns has divided the Permian rocks into the following divisions (the top is missing):—

Kelcey Tier Beds	600 feet thick
Mersey Coal Measures	62-95 + thick
Spreyton Coal Measures	159-578+ thick
Basal Conglomerate	0-180+ thick

Borehole information implies that the basement rocks consists of limestone and quartzite. In the area examined the Permian rocks are poorly exposed and the dip cannot be determined.

Around Tarleton there has been extensive prospecting and small scale mining in the Mersey Coal Measures. About 50 yards from the site Mr Harrison has selected for boring, a water bore intersected the coal band at a depth of about 90 feet. Comparison of the level of the coal band in this bore—and the level of the coal seam about a mile to the S indicates that the N component of the dip is about 3°.

The basal conglomerate intersected in a shaft on the N end of Brown Mountain, compared with the intersection of this horizon in Smith's artesian bore just E of Spreyton railway station indicates a N component slope for the basal conglomerate between 3° and 4°. Comparison of these data with the results obtained from Ayers' bore (Matthews op. cit.), which lies between these two points, substantiates the above conclusion. The levels of the coal band in Smith's and Ayers' bores also indicate a NNE component of dip of a little over 3°. Although no exposures where dips could be measured were found around Tarleton, Reid states that the dip is 7-10°N. Burns (pers. comm.) suggests that the dip at Spreyton and in the area immediately to the S is about 10°N. These dips were probably calculated from surface measurements and the flatter dips indicated by borehole correlation are probably explained by small scale faulting between the holes. A small fault was encounted in Ayers' bore.

HYDROLOGY

The aquifer supplying the artesian water in the area is the Permian basal conglomerate. As only some boreholes in the area have struck artesian water its occurrence appears to be very sporadic. As Tarleton is in a small downthrown block trending approximately NNE (Burns, 1964) there is probably a disruption of the aquifer between Spreyton and Tarleton. Denisons borehole (Burns, 1963) which is S of Tarleton, just E of the W fault forming the downthrown block, was drilled by the Mines Department in 1884 and encountered 105'3" of basal Permian conglomerate underlain by limestone. In Allisons borehole which was drilled W of the fault there was 12 feet of basal Permian conglomerite underlain by quartzite. These holes are about ¾ mile S of the area in which Mr Harrison is interested. Artesian water was not reported from either hole.

The basal beds outcrop on the N and NW side of Brown Mountain at heights up to about 600 feet above sea level. It is probable that these areas would act as catchment zones for water stored in the basal beds further to the N. South-east of Tarleton the basal beds again outcrop, but dips are in a NE direction (Jennings, 1959) and it is not expected that these would supply water to the Tarleton area. Although it can be expected, from borehole information, that the pre-Permian surface was uneven in the Spreyton area, geological evidence indicates that it slopes in a N direction. It would therefore be expected that less hydraulic head would be developed in the Tarleton area than in the Spreyton area.

CONCLUSIONS

Assuming that the thickness of the Permian sediments between the coal seam and basement rocks is fairly constant in this area, and that there is an overall dip of about 3°N, a depth of about 400 feet would have to be drilled to reach basement. As artesian water has only been found in a few of the holes drilled and was not found in the two holes to the S, the chances of obtaining water at Tarleton are fairly slim. However, because of the apparent sporadic nature of its occurrence the possibility of obtaining artsian water should not be ruled out completely.

However, with respect to other sources of groundwater, a shallow hole on the adjacent property yielded 400 gallons per hour from a depth of about 90 feet and it could be expected that similar quantities of such water would be obtained on Mr. Harrison's property.

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