

REPORT ON POSSIBILITIES OF OBTAINING SUPPLIES OF
UNDERGROUND WATER AT POWRANNA

LOCATION AND ACCESS

The property of Mr. A.T. Walters is situated immediately to the south of the railway station of Powranna, and the Hobart to Launceston railway forms the greater part of the north-eastern boundary of the property. The area of the property is somewhat in excess of 2000 acres. In addition to the railway, the Hobart to Launceston road passes close to the north-eastern boundary so that access to the property is readily obtained.

TOPOGRAPHY

The country in the vicinity of Powranna consists of a very flat and level plain at an altitude of 600 feet above the sea, the surface of which is covered with a forest composed mainly of peppermint and white gum trees.

To the south of the property the Hummocky Hills rise abruptly to a height of approximately 500 feet above the level of the plain.

The drainage is to the north-east by numerous small creeks which flow into the South Esk River.

About a mile south-west of the South Esk River, and roughly parallel to it, a low but very distinct scarp about 20 feet in height occurs. This probably represents the south-western edge of the alluvial plain of the South Esk River which would, therefore, be about a mile wide. Several former courses of the river are observable on this alluvial plain, and the course of the stream has been moving to the north-east.

GEOLOGY

The greater part of the property and of the country in the vicinity is occupied by Tertiary lacustrine sediments of the Launceston Tertiary Basin. These strata consist of gravels, conglomerates, clays, sands, and practically all varieties formed by mixtures of clay and sand. They are horizontally bedded, and have not been affected by any movements of folding or tilting since their deposition. The gravels and sands outcrop prominently on the northern part of the property. The southern part of the property is occupied chiefly by clays. On the surface above these clay beds considerable quantities of limonite occur in the form of buck shot gravel, and as larger cemented bodies. The limonite is of secondary origin, and has been formed near the surface by deposition from iron-bearing solutions, the greater part of the iron having been extracted from the decomposed diabase which outcrops in the vicinity.

Diabase outcrops to the south-west of the property and forms the Hummocky Hills. These hills were apparently not covered by the Tertiary sediments and formed an island or islands above the surface of the lake which occupied the Launceston Tertiary Basin. This rock is identical in all respects with the Upper Mesozoic diabase found in other parts of Tasmania. It intruded Trias-Jura strata but these have since been denuded, and only a few pieces

of quartzites are now obtainable. These quartzites represent the result of the metamorphism of the Trias-Jura sandstones by the diabase.

* The only other formation is the recent river alluvium formed along the course of the South Esk and some of the smaller streams.

POSSIBILITIES OF UNDERGROUND WATER SUPPLIES

The conditions essential for the occurrence of supplies of underground water are the existence of porous rocks outcropping at the surface so that a portion of the rainfall may enter them, and a suitable geological structure for accumulation of the water.

The only rocks which need be discussed in this connection are those of Tertiary age since they occupy practically all the surface of the property. The sands, gravels, and some of the impure sandy beds are undoubtedly of a porous nature and likely to contain supplies of underground water provided they outcrop at the surface. These porous beds, however, are not present to any large extent, the clays and sandy clays forming the greater part of the Tertiary strata.

The impervious beds (clays and sandy clays) outcrop over large areas of the surface and so prevent the entry of portion of the rainfall into any underlying porous beds. Also even where porous beds outcrop, the alternation of beds is rapid and impervious beds occur at no great depth and so prevent the accumulation of any large quantities of underground water.

Thus the general conditions are such that the occurrence of any large quantities of underground water is not possible, although small supplies may exist at certain localities.

PRESENT DEVELOPMENTS

Several wells have been sunk on the property by means of a post-hole borer in attempts to obtain supplies of underground water. Except for two of them, these wells have been shallow, but very small quantities of water have been obtained in all of them. The two deep wells were sunk near the stables at the northern extremity of the property where gravels outcrop. As far as could be ascertained the strata passed through were as follows:-

<u>No. 1 Well</u>	<u>No. 2 Well</u>
6 feet Gravels	6 feet Gravels
34 feet Clayey material with interbedded gravels and sands	14 feet Clayey Material
10 feet Soft clayey sand	12 feet Soft clayey sand
<u>50 feet</u>	<u>32 feet</u>

In the No. 1 Well a small supply was struck at 6 feet but did not continue for any period. Finally water was met with at 45 feet and sinking continued to 50 feet, the water rising to 43 feet. This supply has not been tested either as regards quantity or quality.

In the No. 2 Well water was struck at 27 feet and rose to 26 feet. A hand pump was installed but the supply was small, only 16 gallons being pumped twice per day. The quality was such that the water was suitable for stock.

CONCLUSIONS

The two wells described above confirm the conclusions that only small supplies of water are likely to occur. It is unfortunate that the supply in the No. 1 well was not tested as regards quantity and quality, as the supplies obtainable to a depth of 50 feet would then have been definitely known.

Supplies are required for watering stock, the amount necessary being small and in the vicinity of 300 to 400 gallons per day. It is probable that the supply in the No. 1 Well does not amount to this figure and the only possibility of obtaining a sufficient supply is at a greater depth. No guarantee can be given that a supply of 300-400 gallons would be obtained, but it is possible that somewhat larger supplies might be available between 50 and 100 feet than above 50 feet, if there is any passage of water from the South Esk River into any porous beds exposed along its course.

In view of the excessive cost of bringing water from the South Esk River and the small amount of water required, it might be advisable to have a bore put down to 100 feet. No guarantee can be given that the required quantity would be obtained, but if successful the supply would be obtained at a cost far below that necessary to obtain a supply from the South Esk River.

The site of any such bore should be on the northern part of the property, and a position near the stables where the supply is required would be quite suitable. In the siting of any bore on the southern part of the property, positions should be chosen at least a quarter of a mile from the south-west boundary as, owing to the diabase underlying the Tertiary strata at no great depth, supplies would be very small and erratic.

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