



## WATER RESOURCES OF TUNNACK AREA

### Introduction:

Several applications have been made by farmers of the Tunnack Area for bores to augment their present water supplies from underground sources. The applications were received towards the end of 1956 and at the beginning of 1957. The percussion drill was then operating at Triabunna and was expected in Tunnack soon after the applications were made. Due to more work being required in the Triabunna district, the boring at Tunnack has been delayed.

In 1951 the boring plant visited the Tunnack-Stonor area and more than 20 successful bores were put in. No previous geological work has been done in the district so about two months were spent on a preliminary geological survey of the area to determine the possibilities of finding underground water on the properties of the recent applicants.

The area examined is bounded by the Hobart-Launceston railway line in the west and by Hobbs Lagoon in the east. The northern boundary is about  $\frac{1}{4}$  mile north of the Stonor-Baden-Whitefoord road while the southern boundary extends along the top of the Buckland map sheet. This area includes part of both the Oatlands and the Swanston map sheets and is approximately 90 square miles in area.

### Access:

Tunnack is about 45 miles from Hobart via Campania and Cdsbrook or about 53 miles by way of the Midlands Highway and Stonor. The area examined is served well by metal roads except for the far eastern part in which there has been no agricultural development.

### Topography:

The topography is variable and is strongly influenced by the rock type. On the Triassic sandstone are formed two distinct types of topography - rolling hills (used as agricultural land) and large cliffs. The Permian mudstones usually result in a fairly flat surface. Dolerite forms a rugged terrain and is not used much for agriculture. The two highest peaks in the area - Mr. Hobbs (2695') and Mt. Ponsonby (2613') are composed of dolerite.

### Geology:

The main rock types of the area are Permian mudstones and sandstones, Triassic sandstones and shales and Jurassic dolerite. A small area of Tertiary basalt also occurs.

Before the deposition of the Triassic there was a period of erosion during which the Permian surface was made irregular, and as the present erosion cycle has reached the base of the Triassic around Tunnack itself, the impression is often gained that the mudstones overlie the basal Triassic.

#### (a) Permian:

Permian strata are common in the central part of the area (i.e. around Tunnack) and are represented by hard white mudstones. The thickest Permian section seen occurs on a hill north of the Baden-Whitefoord road where there are probably 400' of exposure. At about 300' from the top of this section there is a bed of sandy material with

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conglomeratic lenses. The thickness is of the order of 30'. This sandy bed is rich in fossils-particularly in gastropods and pelecypods, while brachiopods are present in smaller numbers. In other areas where the fossiliferous bed is more of a mudstone, bryozoans are very common, while gastropods and pelecypods decrease in number. This area occurs about  $\frac{1}{4}$  mile to the east of Tunnack. The conglomerate pebbles are fairly angular and the rock is poorly sorted. In most areas this sandstone is pinkish in colour due to staining with iron oxides.

Below the fossiliferous zone, the rock type changes to the hard mudstone. Towards the top of the Permian, the colour changes to dark blue and when broken, whorls of blue material can be seen throughout the rock. Near the junction of the road from Tunnack to Stonor with the Coal River, the top of the Permian occurs and is black and carbonaceous.

The Permian is massively bedded with alternations of more shaley material between the main beds. This is probably due to some small variation in composition and could be due to the presence of slightly more mica. The top of the Permian tends to be very shaley. The dips are usually very shallow except near faults where the beds have been dragged up to 30°. Where the Permian is in contact with the dolerite, a hard black, fine grained quartzite is the product. The top Permian mudstone is probably the equivalent of the Ferntree Mudstone, and the sandstone can probably be correlated with the Sandstone.

#### (b). Triassic

The Triassic starts abruptly with a conglomerate and grit. There does not appear to be any gradation between it and the Permian and there is probably a slight unconformity between the two. The thickness of the grit is usually about 10'. The boulders vary about 6" in diameter but mostly are much smaller. In some areas it appears to be only a grit with an average grain size of about 3 mm. The matrix is usually very fine grained. The conglomerate is made up of quartzite and quartz boulders which in the main are subrounded to rounded. Above the grit in most cases the sandstone follows directly but in one area (on the Coal River) the conglomerate passes into a soft brown mudstone with a few grit pebbles, then into the pure mudstone. Above this there is a hard bluish mudstone very similar to the underlying Permian mudstone, but of coarser grain-size. It is massively bedded as is the Permian but is probably only a facies change of the sandstone as its grain-size is almost that of sand. The total exposure above the grit is about 15'.

The sandstone overlying the grit is massively bedded and is made up almost entirely of quartz particles. Honeycomb weathering is a feature in the cliff faces and current bedding can be seen occasionally.

The Knocklofty Sandstone is present in some areas but was not mapped as a separate unit. It consists of alternations of sandstone and shale which is often fissile. Dips of up to 10-15° were observed, but generally it is flat-lying.

The dolerite does not seem to affect the sandstone very much except right on the contact.

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Jurassic

The area has been extensively intruded by dolerite and most of these intrusions appear to be transgressive in nature. Faulting which occurs in the area is probably associated with these intrusions.

Tertiary

There are no Tertiary sediments and only one small patch of basalt occurs in the area. This is situated on a hill not far from the Stonor-Baden road and overlies the sandstone. Vesicles are common and are usually filled with a white substance which is probably a zeolite. Olivine can be seen in the hand specimen.

Areas suitable for Boring.

Tunnack and the surrounding country is an agricultural area and in common with the main Midlands areas, has a low summer rainfall. Extra supplies of water are therefore required during summer for use with dairies, cattle, gardens and for the house. It is for these reasons that most applications were made.

A large area around Tunnack itself consists of Permian mudstone which is generally not considered a good aquifer unless it has been brecciated by faulting. Several of the bores put down in 1951 were in the mudstone and good supplies were obtained but it appears that these are either on a fault or are situated very near to one. Permian sandstones are not considered good water bearing rocks. As stated before a large area is either Permian mudstone or other Permian sediments overlain by basal Triassic grits and conglomerates which are hard and resistant to weathering and have a maximum thickness of about 10'. They are not thick enough to hold much water and are probably not very permeable because of the abundance and the fine grained nature of the matrix.

Provided there is a great enough thickness of sandstone overlying the Permian, the sandstone is generally considered very suitable for boring.

Of the fifteen applications originally received two have been withdrawn and seven of the remaining properties were found to be sited on Permian strata which in general is not considered to be favourable for the retention of water.

In view of the experience gained by boring carried out in the year 1951 when some 20 bores, five of which were commenced in Permian strata, were successful, it was considered advisable that the property of the original applicant Mr. L.I. Scott be bored to test the potential of the Permian at that point. Four of the other applicants are situated close to Mr. Scott and will have more information on which to base their decision to bore or otherwise, after Mr. Scott's bore is drilled. The remaining two applicants situated on Permian live near properties where successful bores, on the Permian, were put down in 1951.

| <u>Name of Applicant.</u> | <u>Address</u> | <u>Date of Application</u> |             |
|---------------------------|----------------|----------------------------|-------------|
| L.I. Scott                | Tunnack        | 10.1.56                    | recommended |
| Albert Scott              | "              | 10.1.56                    |             |
| S.J. Summers              | Baden          | 12.1.56                    |             |

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|-----------------------|------------|---------|----------------------|
| S.T. Young            | Baden      | 16.1.56 | recommended          |
| Walter Bowerman       | Baden      | 8.2.57  |                      |
| Gerald Lane           | Tunnack    | 11.2.57 | recommended          |
| K.H. Lynch            | "          | 12.2.57 |                      |
| D.F. Byrne            | "          | 12.2.57 | cancelled Jan. 1959. |
| R <sup>c</sup> Ground | "          | 13.2.57 | recommended          |
| Mrs. B.M. Palmer      | "          | 11.3.57 |                      |
| L.C. Wilson           | Whitefoord | 13.3.57 | cancelled 15.12.58   |
| S.A. Scott            | Tunnack    | 19.3.57 |                      |
| W.H. Hart             | "          | 25.3.57 | recommended          |
| G.W. Palmer           | Stonor     | 17.4.57 | recommended          |
| C.&L. Wickham         | Stonor     | 22.5.57 | recommended          |

(W. L. Matthews)  
GEOLOGIST

3rd June, 1959.

Department of Mines,  
HOBART.