

UNDERGROUND WATER AT RESERVATION CAPE BARREN ISLAND.GENERAL:

Water for drinking and cooking purposes at the main settlement (officially Franklin Village) in the northern part of half-caste reservation is very limited. Few of the inhabitants have adequate tank storage at the houses and, even in winter, drinking water has at times to be obtained from the school supply. The only stream in the vicinity is hard and undrinkable. During summer months it has been the practice to carry water by hand up to a distance of one and a half miles, portion of which is down a steep hillside, from a spring at eastern boundary of Reservation.

LOCATION and ACCESS:

The main settlement fronts onto Sandford Bay in the north-western part of Cape Barren Island. A landing point has been established by means of a small jetty at the western point of the bay ("The Corners".) Long Island lies  $3/4$  of a mile off shore and acts as a protection from westerly weather.

Access to the settlement is gained by means of a small steamer and ketches trading between Tasmania and Flinders Island. A landing ground suitable for small aeroplanes is available on the Reservation, but no regular service is maintained.

TOPOGRAPHY:

The chief topographical feature is represented by an open plain or undulating valley rising abruptly to a height of 25 feet from sea level on Sandford Bay.

The plain, which is 30 chains wide in the north, extends in a southerly direction and rises gradually to a height of 75 feet before falling similarly to Thunder and Lightning Bay in the south-west of the Island, widening considerably in that direction.

Eastern edge of the plain is marked by an outstanding meridional trending range of hills (Home Hills) rising steeply to about 600 feet above plain level. On western side the plain is bounded by a low north and south line of hills, culminating in the south at Mt. Stanley, the highest point.

Sandford Bay is a well sheltered and shallow cove, at low tide the water recedes for  $1/4$  of a mile or more from high-water mark.

The only stream of consequence is a small creek running in a general northerly direction, through the Settlement, to Sandford Bay. The main source of this creek is a spring situated in the Water Reserve about 55 chains above the mouth.

On western boundary of Reservation two small but perennial springs exist. The more southern one occurs

at the north-east corner of Lot 25 on western fall of Home Hills and the water from it flows for a few chains before soaking underground. A small depression from this point leads to a well defined gully 12 chains to the north and in which, during rainy seasons, a good stream of water flows to Thunder and Lightning Bay. In summer the creek is dry.

The other spring is situated about 10 chains south east of C. trig. station in a flat open basin, 480 feet above sea level, on east side of Home Hills. On reaching basin edge the water falls to the east over large granite outcrops but soaks underground on reaching more even grades, several hundred feet below.

GEOLOGY:

The geology of the area is comparatively simple and is represented by marine sands and limestones deposited between former granite islands on a floor of granite. Since the deposition of the former rocks a rise in the strand line has brought the sediments above sea level. Later denudation has now reduced the sands and limestones of the plain to a general level of 50 feet above sea level.

(a) Tertiary: The rocks of this series consist of level bedded, loose to partly consolidated sands with interstratified impure limestones.

The sands are generally fine to medium in grain and consist chiefly of quartz with lesser amounts of felspar and shell fragments.

The limestones vary in colour from light brown to grey and blue-grey. The lime content of these rocks also varies and different types may be classified as calcareous sandstones, arenaceous limestones, and limestones. A vertical section of these rocks exposed above high-water mark at Sandford Bay shows the sequence at that point to be as follows:-

<u>Rock type.</u>	<u>Thickness.</u>
Compact fine sands with small shell fragments ..	4 feet.
Soft weathered limestone with small gastropoda ..	0ft. 12in.
Loosely compact quartz sand with small shell fragments	0 " 12"
Coarse calcareous sandstone .. .. .	1 " 6"
<b>Hard dark-grey limestone, carrying a little quartz sand.</b>	0" 8"
Compact fine to medium grained sands with small univalve shells. .. .. .	2" 4"
Clay .. .. .	0" 3"
Black loamy sand with little clay material ..	2" 6"

Bottom not exposed.

These sands and limestones rest on a floor of granite and extend over the whole of the plain area, and to varying distances up the lower slopes of the hills. At the north-west end of Home Hills limestones outcrop at a height of 260 feet above sea level.

(b) Devonian: Granite - This rock varies from normal biotite granite to porphyritic granite with large felspar phenocrysts.

Except for the foothills, granite outcrops along the whole of the eastern range known as Home Hills. Along the western low line of hills the granite is not continuous at surface. It outcrops at the jetty and along the coast line to the south-west. Inland the granite continues southerly along the ridge in a narrowing belt for approximately 110 chains. It then gives place to sands and limestones but outcrops again on the summit of Mt. Stanley further south,

(c) At west side of Sandford Bay a dolerite dyke trending at  $40^{\circ}$  is intrusive into porphyritic granite. The rock is dark grey-green in colour and from fine to coarse in grain. Where coarse grained, in the centre of dyke, the rock assumes a gabbroid facies. The rock is only visible on the shore below high-water mark and has not been traced inland.

#### UNDERGROUND WATER.

The sands, interbedded with limestones, spread over the plain area of this district would be the chief repository of under-ground water. Water derived from direct penetration of rain and also soakage from the hills run-off would tend to accumulate in and saturate these sands, particularly at lower depths. The sands being a marine deposit contain varying quantities of salts, part of which would be taken into solution by any water in the sand beds. This applies in particular to the deeper portion of the deposit near the middle of the plain. Towards the outer edges, near the granite of Home Hills for instance, it is reasonable to suppose that the water would be purer owing to continual soakage of fresh water from springs and general run-off from the higher ground.

Generally it can be said that the possibilities of obtaining under-ground water from shallow depths (down to 50 feet) at the Settlement are good but that the water in most cases would not be suitable for drinking purposes.

The quantity and quality of the water could be tested by means of a series of bore holes.

In the event of a suitable supply of water being obtained it could be raised by means of windmills and conveyed by pipe-line to enclosed concrete tanks at convenient points.

Other sources of supply: If the underground sources of supply proved unsuitable or inadequate the question of bringing within easy reaching distance the water from the perennial springs should be considered. Both these springs appear to be of excellent drinking quality. The spring at north-east corner of Lot 25, although apparently producing less water than the one further north is much closer to the consuming point and would, therefore, entail less outlay for conveyance.

The first step in obtaining a supply from this source would be to open out the spring by digging a well,

or other suitable means, and then testing the hourly quantity of water produced. If this proved satisfactory then a pipe line could be laid to gravitate the water to tanks where needed.

RECOMMENDATIONS.

To enable the quantity and quality of available underground water in the vicinity of the settlement to be gauged, it is recommended that a series of holes be sunk by means of a hand-boring plant.

The position of No. 1 bore site has been fixed in the Recreation Reserve near the northern corner. From No. 1 Bore 4 or 5 other bores should be sunk along a south easterly line at intervals of approximately 12 chains to about the creek bed near west boundary of Lot 24.

If water supplies are obtained during boring the water should be analysed to test the drinking quality and pumping tests should be carried out to obtain data with regard to quantity.

(Signed) F. BLAKE,

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