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1976/11. Groundwater prospects near South Arm.

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Mr A. Fenton owns two properties near South Arm. 'Lennaville', 26 ha [341382]\* overlooks Ralphs Bay and fronts onto Beach Road. The smaller 3 ha block [336374] on the opposite side of the South Arm peninsula is bounded by the Opossum Bay Road, Musk Lane and Half Moon Bay beach. The owner requested advice on the possibility of obtaining groundwater on each.

Site 1. 'Lennaville'

The land rises sharply from Ralphs Bay, but is gently undulating towards the Opossum Bay Road. It is covered by a veneer of sand and clay derived partly from weathering of the underlying Triassic sandstone, and partly from aeolian processes. Two water holes situated at the bottom of the slope near Ralphs Bay receive water from surface runoff and groundwater sources. The salinities of the water range from 5-6000 mg/l total dissolved solids (T.D.S.) in the lower waterhole, to 2600 mg/l T.D.S. in the higher one at the base of the slope.

Three seismic spreads [340383], [339384] and [338382] respectively, were fired in the unconsolidated sands near the farm house. Each indicated a low velocity (500-600 m/sec) layer of dry sand overlying saturated sand and clay (1600 m/sec). The depth to bedrock is variable over the property, and probably exceeds 15 m in places.

Two holes were augered on the property. The first, placed at the centre of seismic Spread 1 intersected sand with clayey and partly cemented calcareous horizons before intersecting good quality (325 mg/l T.D.S.) water at 4 m. A second hole drilled 50 m north of the house passed through similar material to a depth of 5 m. No water was struck.

Prospects for obtaining groundwater from the unconsolidated sands at 'Lennaville', are not considered favourable. The water table is relatively deep, and although the water obtained was of good quality, insufficient quantities are probably present. Furthermore, the quality probably decreases with depth. It is likely that the sand also becomes increasingly clayey with depth, passing into weathered and then fresh Triassic sandstone.

Site 2

This property is flat-lying near Opossum Bay beach, but rises gently to Opossum Bay Road. It is covered with a veneer of aeolian sand, the thickness of which probably decreases eastwards. A hole augered in the lowest north-western corner of the block passed through grey-brown medium-grained aeolian sand, and struck water (500 mg/l T.D.S.) at 2.3 m. Subsequently the owner constructed a concrete-lined well at the rear of the coastal dunes [336374] bordering Opossum Bay beach. On pumping, the well sustained yields of about 30 l/min<sup>-1</sup> for approximately 20 minutes. A spear bore, jetted in the well to a depth of 3 m below the water table was pump tested at a rate of 35 l/min<sup>-1</sup>. Such a rate could be continued indefinitely. A sample of the water was analysed by the Department of Mines Laboratories, Launceston.

The water quality is lower than that obtained from the augered hole because the latter sampled only the fresher upper levels of the aquifer. As analysed, the water pumped from the spear is unsuitable for drinking purposes, but is probably marginally suitable for gardens (depending on the vegetables irrigated).

\*All localities lie within the AMG 100 kilometre grid square EN.

ANALYSIS OF WATER FROM WELL AT SITE 2 (Registered No. 742683)

Constituent		mg/l	Constituent		mg/l
Silica	(SiO <sub>2</sub> )	13	Chloride	(Cl)	590
Iron	(Fe)	5.6	Total dissolved solids		1560
Calcium	(Ca)	58	Hardness (as CaCO <sub>3</sub> )		380
Magnesium	(Mg)	58	(Temporary hardness		170)
Sodium	(Na)	420	Alkalinity (as CaCO <sub>3</sub> )		170
Potassium	(K)	8.3	pH		7.0
Bicarbonate	(HCO <sub>3</sub> )	210	Sodium Absorption Ratio		9.3
Sulphate	(SO <sub>4</sub> )	220			

CONCLUSIONS

Of the two properties investigated Site 2 has better water prospects, and a series of shallow wells sited behind the foredunes will supply considerable quantities of water. The resource should be tapped by means of shallow wells drawing water from the upper levels of the aquifer. Spears should be avoided, as the water at deeper levels is much poorer in quality.

If the groundwater is to be used for relatively large scale drinking purposes, the supply should first be monitored for any changes of water quality and biological tests should be carried out to eliminate possible health hazards.

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