UR1973_69

Groundwater prospects at South Arm.

W.C. Cromer

A request for an investigation into groundwater prospects on land at South Arm was received from B. Edwards. The property (0.1 ha) is a corner block at the junction of the Opossum Bay Road and Saltair Crescent, approximately 300 m north of the South Arm Post Office. It occupies the rear gently sloping face of a stable vegetation-tied sand dune, the last in a series of such ridges extending inland from South Arm Beach. Water is needed for domestic and garden purposes.

GEOPHYSICAL WORK

A single electrical-resistivity probe was placed along that part of the property fronting the Opossum Bay Road. Results show that apparent resistivity remains relatively constant to a shallow depth (indicating the presence of dry to damp sand), but decreases rapidly with increasing depth. The latter effect is generally attributed to the presence of clay, saline water, or both.

AUGERING

A single auger hole placed at the centre of the resistivity probe intersected the water table at 3 m after penetrating brown and yellow sands, and red-brown clays at 2.8 m. The water at 3 m was fresh. It is probably suitable for the use envisaged, although a sample was not obtained for testing.

CONCLUSIONS AND RECOMMENDATIONS

Fresh water is present at shallow depth (3 m) on the property. It may become more saline with depth although there are probably sufficient amounts of fresh water for domestic usage.

It is recommended that the water be obtained by either of two methods:

(1) By digging a well: large diameter excavations have the advantage of large storage capacities, permitting high pumping rates (approximately 30 *l*/min is considered possible from sandy aquifers) and thus avoiding the need to excavate more than a metre or so below the water table. To prevent collapse, both the well sides and bottom will require lining.

(2) By sinking one or more spear bores. A spear can be jetted down to the required depth (approximately 3 m below the water table). The maximum pumping rate per spear should be 10-15 *l*/min if the instrument is operating effectively. If more spears are required, they should not be less than about 15 m apart. It may be necessary to determine the grain size of the water-bearing sand to assist in selecting an appropriate mesh size for the spear. This will reduce the likelihood of sand contamination during pumping.

Because seasonal variations in rainfall cause fluctuations in the level of the water table, it is recommended that well excavation (or positioning of a spear bore) be carried out in the drier months. The well or spear should be placed in the lowest part of the property near the Opossum Bay Road. The water should be pumped at the lowest possible rates (over extended periods) and not drawn at high rates for short irregular periods. Any impervious clays encountered below the water table should not be penetrated.

[4 September 1973]