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DEPARTMENT OF MINES.

South Australia

REPORT ON GROUNDWATER PROSPECTS

Section Pt. 6028, Hundred Talunga - Miss M. Hynes

This section was inspected on the 10th February, 1954.

REQUIREMENTS:

Groundwater is required for the growing of potatoes under irrigation, and the minimum quantity is understood to be 2,000 gallons per hour.

LOCATION, TOPOGRAPHY:

The section is about 1 mile north east of Gumeracha, and covers the crest and part of the northern and southern flanks of a ridge north of the Torrens River. A large part of the block is of considerable elevation, although the south eastern corner extends downward nearly to the river. The northern boundary is some forty feet or so above a watercourse running east - west a few chains outside the section.

Rainfall has been stated to be approximately 32 inches per annum. Since the land surface is untimbered but has a good pasture cover, a reasonable proportion of the rainfall would be accounted for by downward percolation into the underlying rocks, provided these were reasonably permeable.

GEOLOGY, HYDROLOGY:

The whole area is underlain by rocks of the Torrensian (Proterozoic) Series, within a zone of rather pronounced regional metamorphism. The rocks themselves comprise micaceous sandy schists and gneisses intruded by thin pegmatite dykes and quartz veins. In some places the metamorphism is intense, the rocks being dense, hard, and poorly jointed, areas affected in this manner having a very poor groundwater potential because the cracks and joints in which the water normally occurs have been compressed and partly sealed during metamorphism.

Investigation shows that Section 6028 itself in part overlies dense siliceous schists with a general strike west of north, and a steep easterly dip. Surface outcrops of other than the hardest rocks are masked by a mantle of weathered material, but the whole sequence is of ancient altered sediments excepting for a few minor quartz veins possibly associated with thin pegmatites. Well developed pegmatite dykes parallel to the strike are exposed near the eastern boundary in Section 6022, there being evidence that they are associated with faulting.

Quartz boulders were found on the surface in several places, and at one point an outcrop of gneiss is associated with a small permanent spring.

Past experience with rocks of this type is that they commonly carry water but only in stock supply, except in places where intake and replenishment conditions are very favourable, as for example, along the valleys of creeks and watercourses. Beneath all the higher central part of the

section it is probable that a bore would obtain a stock supply, but the drilling conditions would be rather hard. It is not considered that anything approaching the quantity desired would be obtainable.

The only places where local intake conditions should be better are in the lowest lying part of the northern boundary near the north-east corner, and at the south-east corner of the block. This latter is close to the Torrens River where permanent water occurs in rock-holes, and the river course is itself along the strike of the underlying rocks, the tip-tilted edges of which are therefore well exposed and afford the best conditions for water to percolate down into them. Unfortunately, however, the rocks in this part are a fairly dense series of quartzite-schists, strongly silicified and with only a poorly developed joint system, so that their permeability would probably be low and the possibility of obtaining irrigation supplies of water by drilling into them is considerably reduced. Possibly the best place to locate such a bore would be as close as possible to the bed of the river near the bend, at point "A", but it is not considered that there is a very favourable prospect of obtaining more than a stock supply of water.

Along the northern boundary the watercourse is some little distance away, and local intake into rocks underlying the section would be consequently reduced. However, at the point "B" on the attached plan, it is possible that the rocks may be rather less hardened than elsewhere and this is considered the least doubtful location on the whole section, for the construction of a bore. The site has been indicated

to Mr. Hynes. Drilling would be in a sandy schist, and if undertaken, should be continued to at least 250 ft. if sufficient water is not obtained before that depth is reached. It must be emphasized, however, that drilling for the sole purpose of obtaining an irrigation supply cannot greatly be recommended, as there is considerable doubt as to the supply obtainable. Furthermore, the groundwater quality may not be very good. Bores not far away are known to yield water suitable for use on plants, but these bores are located on or very close to watercourses, and have ready access to good quality surface water for replenishment

It is considered that the spring at "C" probably owes its existence to the hard gneiss in which it occurs. Such a rock would afford little access for the downward percolation of rainwater soakage and the spring has apparently been caused by such soakage riding on top of the hard rock and moving laterally till it appears at the sloping hill surface, rather than working down to depth. In fact the existence of the spring is considered a discouraging factor, unless its flow is in itself enough for requirements, which seems unlikely.

SUMMARY AND CONCLUSIONS:

The chances of obtaining 2,000 gallons per hour of irrigation water by drilling are not considered good.

Drilling on or near the hill top cannot be recommended and a bore at site "B" appears to offer the best chance of success, but there is some doubt both as to the quantity and perhaps the quality of the water obtainable and also the permanence of any large supply, if such were obtained. A bore at site "A" should obtain good quality water, but

the supply is doubtful, and could only be ascertained by actual drilling. Unless a water supply for stock purposes were desirable, drilling can in neither case be greatly recommended.

Drilling conditions are expected to be hard, and costs might be £2. 10. 0 to £3. 0. 0 per foot, including casing. If undertaken, drilling should not be discontinued at a shallower depth than 200 ft. for site "A", and 250 ft. for site "B", in the case of failure at lesser depths.

D.O'Driscoll
SENIOR GEOLOGIST.
HYDROLOGY.

15th February, 1954.
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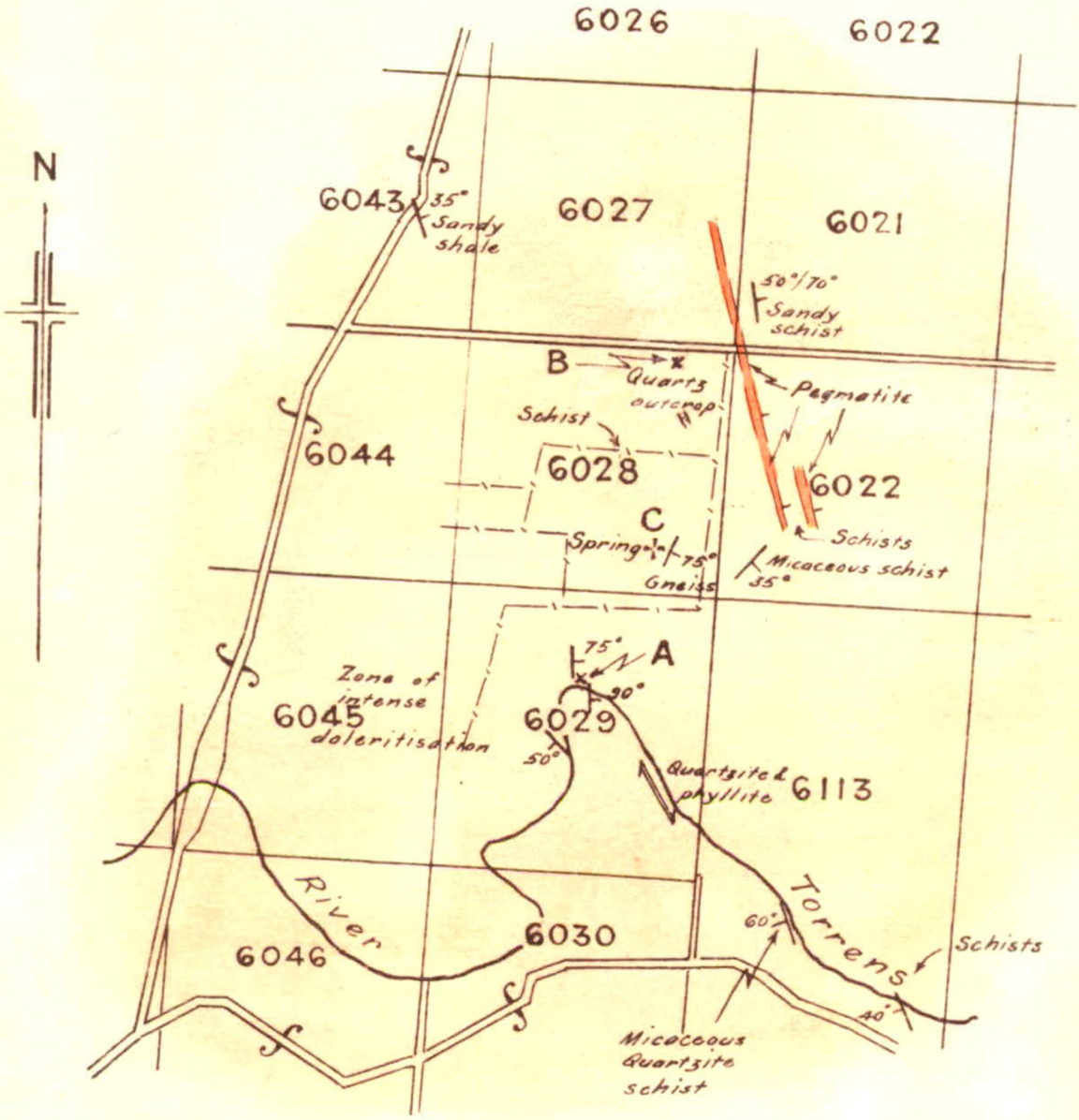

TORRENSIAN SERIES

Micaceous sandy schists and gneisses

Pegmatite - - - - - - - - - - - - - - - -

Selected sites A

To accompany report by E. O'Driscoll.
Senior Geologist.

S. A. DEPT. OF MINES

Approved	Passed	Drn. R.R.	UNDERGROUND WATER SURVEY Hd TALUNGA Sec. 6028/9 Miss M. HYNES		Scale 20 Chns. to 1 In.
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