RB 38/13

HYD. 44

U N C L A S S I F I E D

DEPARTMENT OF MINES

SOUTH AUSTRALIA

REPORT ON GROUNDWATER PROSPECTS

HUNDRED, FREELING, SECTION 3555

S. & C. Giles.

The property was inspected on 26th July, 1954.

REQUIREMENTS:-

Water in sufficient quantity and of a quality suitable for spray irrigation of lucerne, potatoes, etc, is required.

LOCATION, TOPOGRAPHY:-

Loc ated at Langhorne's Creek, the section is situated on the flood plain of the River Bremer which intersects it. Surface topography is flat except for occasional elongated depressions indicating abandoned stream courses.

Away from the river, on either side, the country is gently undulating, with low sand hills of recent origin occurring sporadically.

GEOLOGY, HYDROLOGY:-

The area is situated in the western portion of the Murray Basin, and about 3 miles from its western margin which is marked by a series of low hills formed by outcropping Kanmantoo sandy schists and micaceous quartzites. These rocks disappear beneath the basin sediments and are sometimes intersected at depth in bores farther east, one such instance being a bore about a mile south of Langhorne's Creek, where bedrock occurred at 380 feet.

The stratigraphical sequence in this bore was as follows:-

0'	-	20'	Sands and clays
20'	-	115'	Very tough yellow clay
115'	-	290'	Bryozoal limestone
330'	-	380'	Lignitic clays, sands, and gritty limestones.

Below 380' - Bedrock.

In the vicinity of Langhorne's Creek there are numerous shallow wells and bores giving small supplies of water (100 - 250 gallons per hour). The salinity of the shallow water increases markedly away from the river which apparently a source of local replenishment, at least of the shallow groundwaters.

Several deeper bores in the area produce large supplies of water (10,000 - 15,000 gallons per hour), the depths ranging from 120 to 400 feet, the majority being about 140 feet. Salinities vary from approximately 100 to 150 grains/gallon.

The main waterbearing bed appears to be a rather fine grained and very sandy calcarenite, intercalated with bands of bryozoal limestone, but there are noticeable local variations in the permeability, so that large supplies are not always obtainable. The exact age of the limestone series is in doubt, but the fossil assemblage appears to be Lower Oligocene, and it may be roughly contemporanous with the so-called Mannum beds.

A bore was constructed some years ago in approximately the centre of Section 3555, and is reported as having yielded only a poor supply, although drilling was continued to a depth of about 200 feet. There is no information on the water quality, but water obtained in other bores drilled in the neighbourhood is generally satisfactory for the watering of lucerne and could probably be used successfully on some pastures, such as strawberry clover. The light sandy nature of the soil is an advantage in this respect. Had it not been for the existence of this unsatisfactory bore, the weight of evidance would have been considered to favour the possibility of obtaining an irrigation supply by drilling on the Section. There are, however, two possibilities to be considered. One is that the bore may have penetrated the limestone

series at a place where its permability was less than usual, by reason of a higher than normal clay content, or because the material was unusually fine grained. Such conditions are often very localised, and a bore at some not very distant site might be much more successful at a similar depth. As previously noted, marked variations in permeability are locally common. The second possibility is that the bore may not have been deep enough, as the sediments are probably considerably thicker than the depth drilled.

CONCLUSIONS & RECOMMENDATIONS:-

A series of waterbearing sediments probably more than 350 feet thick is believed to exist under Section 3555. There is a reasonable expectation that drilling into these will produce an irrigation supply of water, but the depth of such a bore will probably be 250 - 350 feet. Success appears to depend largely on the permeability of the waterbearing beds at the point penetrated, and this cannot be predicted.

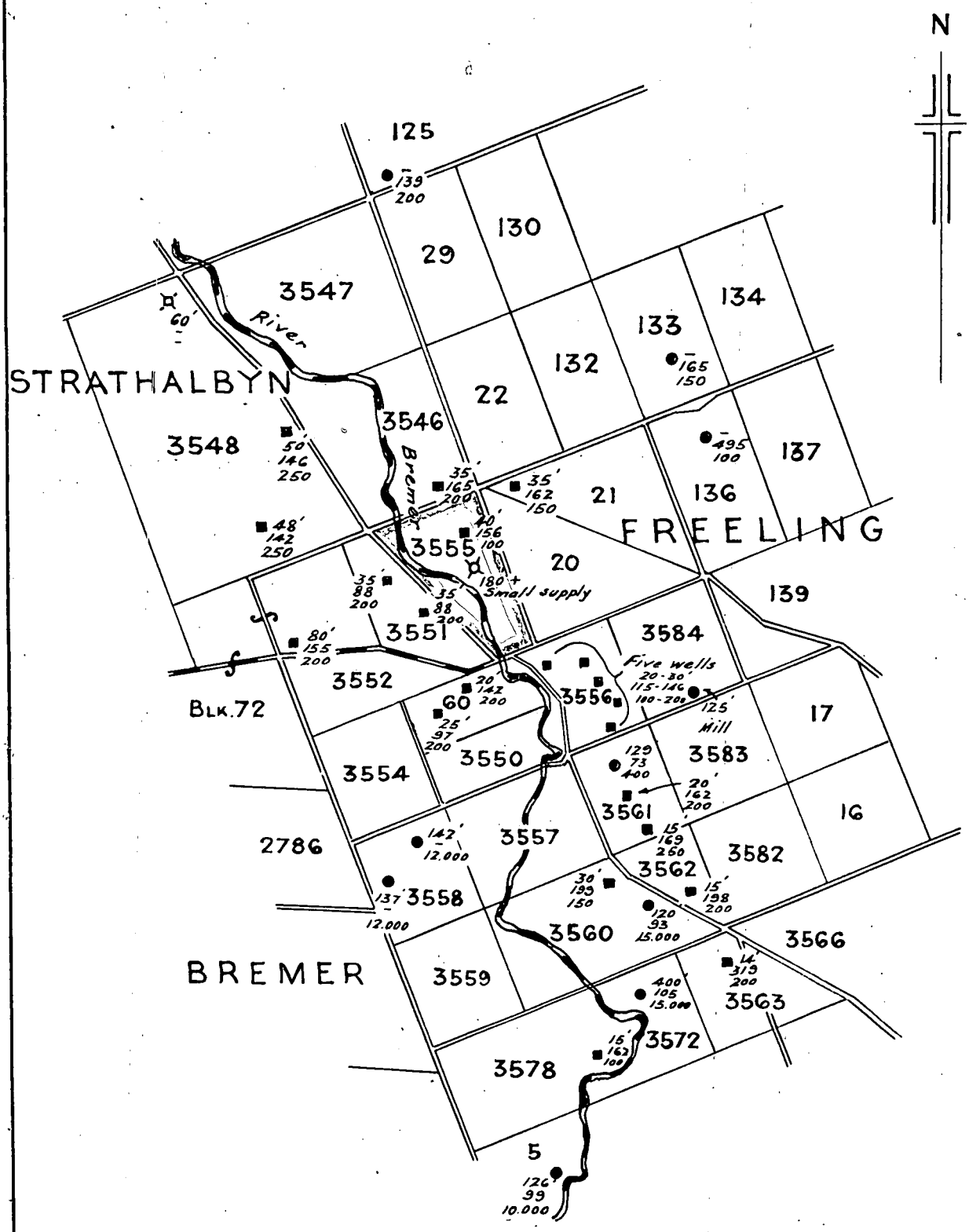
It is suggested however, that the bore be located to suit the convenience of the owner, but as far as possible from the site of the previous, unsuccessful bore.

Cost of drilling is estimated at £300-350, plus casing at 10/- per foot. It is probable that casing will not be needed for the full depth, as despite the rather fine and very sandy nature of the aquifer, it appears in general to be capable of standing unsupported in the hole, even when the bore is heavily pumped.

J. J. Jenkin,
ASSISTANT GEOLOGIST.

E.P. O'DRISCOLL 2/8/54
SENIOR GEOLOGIST, HYDROLOGY

JJJ:EPO'D:BK
30/7/54.



Bore ------ ● 50' Depth in feet.
146 Salinity - Grains/gallon.
250 Supply - Gallons/hour.

Well ------ ■

To accompany report by J.J. Jenkin.

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn.	UNDERGROUND WATER SURVEY	Date	Scale 40 Chns. to 1 inch
		Tcd. R.A.	HD FREELING SEC. 3555	Rec.	S 935
		Ckd.	S. & C. GILES		Hc 9
Director		Exd.	LANGHORNE CREEK		Date 29-7-54