Director

DEPARTMENT OF MINES

SOUTH AUSTRALIA

2203/53

RB 36/73

REPORT ON GROUNDWATER PROSPECTS, HDS. 220 & 221

HD. BURDETT - H.A. WELL

This property was inspected in company with Mr. B. Fitzpatrick, on 21/10/53.

REQUIREMENTS

Applicant wishes to construct a bore for stock watering purposes, on the western or north-western part of the property.

LOCATION, TOPOGRAPHY ETC

The Sections are in the extreme southeast corner of the Hundred of Burdett. Topographic relief is fairly marked because of the occurrence of sand dune rises with associated travertine. The southwestern corner of Sec 221 is on the crest of one such high rise, while the northern property boundary fronts on a rather extensive depression with a general east-west axis. The southern flank of this depression rises interruptedly to an east-west dune crest near the middle of the property, the surface then undulating to the southwards, with minor semi-closed depressions or drainage basins. Despite the relief, surface runoff is at a minimum because of the sandy nature of the soil, and practically the whole of the rainfall is lost by downward percolation or transpiration.

Annual rainfall is approximately 15 inches.

GEOLOGY, HYDROLOGY

The property lies within, and near the western margin of the Murray Basin sedimentation, the geological sequence of which is Pleistocene sands over Miocene sands, sandy clays and limestone, this latter being waterbearing at a level roughly approximating to sea level. The Miocene limestone usually rests on Pre-cambrian rocks or also granite, although there are some times basal Mid-Miocene freshwater sands and clays immediately above the bedrock.

A survey of this district by Barnes and others in recent years

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has shown that the groundwater obtainable from the limestone is in general suitable for stock, but that there is a horseshoe shaped belt of country around the point of function of the Hundred of Seymour, Burdett & Ettrick where stock water is not obtainable. In this belt, many of the bores are recorded as having penetrated granite, and surface outcrops of granite have been observed in several places. One such is actually on applicant's property, on the southern part of Sec. 221. Other bores have obtained water, but often in very limited supply, and of a quality too saline for stock, even when the water occurs in Miocene limestone. It seems reasonable to suppose that the water quality has been influenced by the presence of the granite, which could have an effect either by reason of its forming a barrier to the immigration of good quality groundwaters from the intake beds further east, or by direct pollution of the groundwater by soluble salts resulting from the chemical decomposition of constituent minerals. This latter is possibly the more likely suggestion.

Mr. Simon's property lies very close to the edge of this saline water belt, which passes through the adjacent properties to the westward. Drilling on the western portion of the property is therefore subject to the considerations that granite may be met at shallow depth, precluding the possibility of obtaining water at all, or the groundwater may be saline. It might be possible to offset this latter, at least to some extent, by siting the bore in a drainage depression where increased downward seepage of rainwater could reasonably be expected to cause a local sweetening of the groundwater. There is a recently constructed bore on the east boundary of Sec. 221, within a mile of the granite outcrop. This bore is 165 feet in depth, and penetrated limestone, the water quality being tested at 574 grains per gallon A.I.S.

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The bore is in a well marked depression, where vertical downward percolation would be at a maximum.

Somewhat similar conditions exist along the northern margin of Sec. 220, which fronts a very marked depression, and it is considered that drilling in this area, at the site indicated as Site 1 on the accompanying plan, offers a reasonable chance of success, provided that granite is not met with at too shallow a depth. Water should be obtainable at a depth of 120-150 feet, and drilling conditions are expected to be good. Drilling should be discontinued if granite is reached.

The salinity is expected to exceed 550 grains per gallon, but may reasonably be anticipated as being usable for sheep and beef cattle.

In the event of a bore at Site 1, proving a failure, a possible alternative site is indicated at 2, in an intervening depression where, once again, local sweetening by downward percolation is expected. Site 2, is not considered as good as site 1, being further towards the known saline water belt, and perhaps rather more likely also to meet granite. It should not be drilled until the possibilities at 1 have been exhausted. Depth, if granite is not met with, will probably be 150' - 175'.

CONCLUSIONS & RECOMMENDATIONS

The property is near the margin of a known salt water area, and the quality of the groundwater will not be very good. One site and a possible alternative have been selected, where local sweetening by downward percolation of rainwater is expected to cause some improvement in quality.

Granite outcrops on the property, and its depth below surface at either site cannot be predicted. If it is reached by drilling before water is obtained, drilling should cease immediately.

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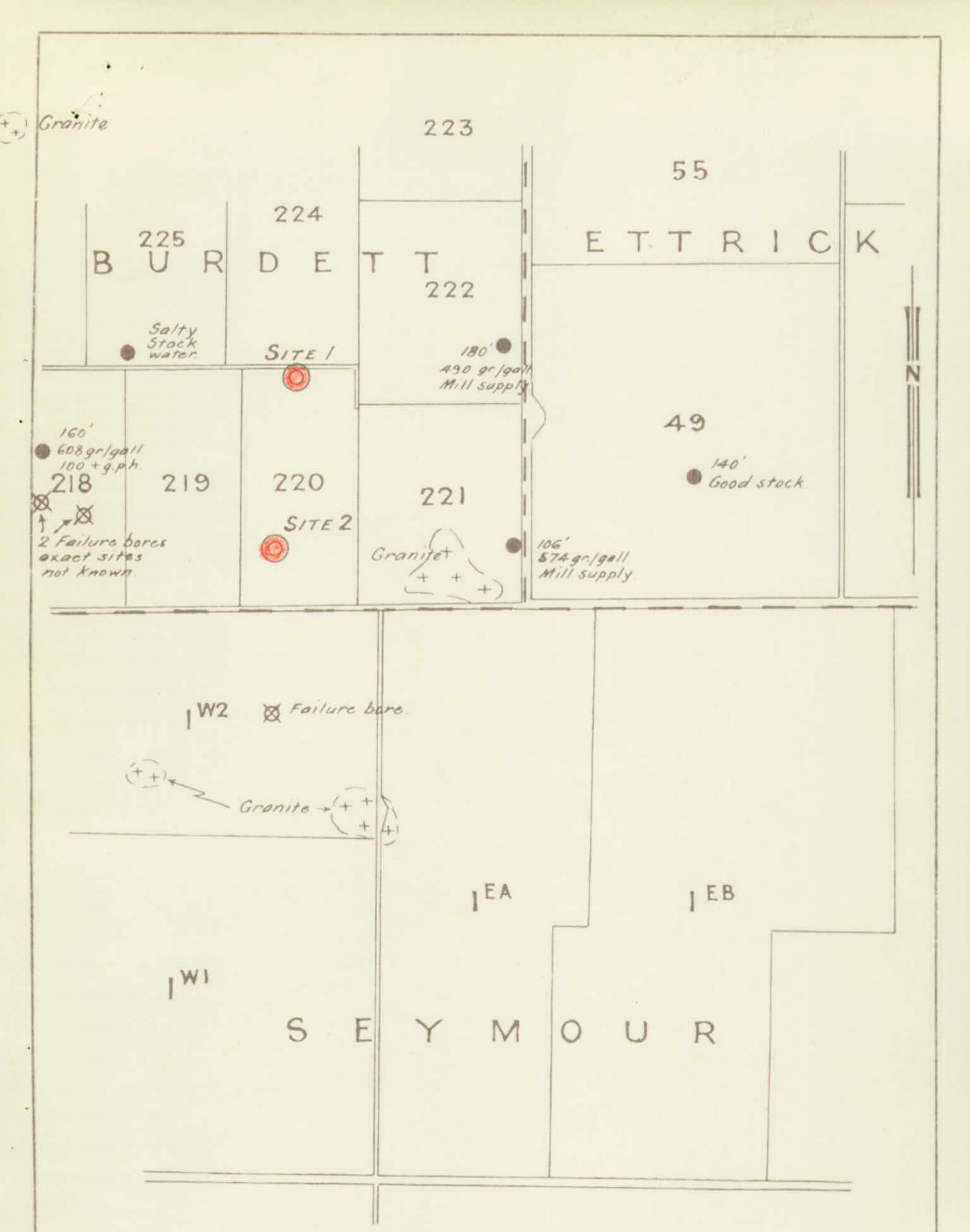
Site 1, should be drilled first.

Drilling conditions in sandy clays and limestone should be good, possibly 20 feet per shift.

D.P.O'RIORDAN 26/10/53
SENIOR GEOLOGIST
BY.GEOLOGY

DPO'D:BK
23/10/53.



To accompany report by E. O'Driscoll.

S. A. DEPT. OF MINES

		RR	UNDERGROUND WATER SURVEY Hd BURDETT Sec. 220 E. A. WINEN		40 CHNS TO 1 INCH S 842 Jo 2/4 26 10 '53