Hyd. Conv

Rept. Bk. No. 48/84
G.S. No. 1308
D.M. 535/59
HYD. 694
M 1449

DEPARTMENT OF MINES
SOUTH AUSTRALIA

REPORT ON GROUNDWATER PROSPECTS

SECTIONS 168, 169, 174, HD. LINCOLN

- G.J. & J.G. WHILLAS -

This property was inspected on 16/3/59.

REQUIREMENTS:

Advice on the prospects of obtaining water suitable for stock, a supply of 100-200 gallons per hour being required.

LOCATION, TOPOGRAPHY:

Situated about 6 miles north west of Pt. Lincoln and 2 miles north of Little Swamp, the property occupies gently undulating country. Drainage is generally south westerly apart from a small area near the eastern boundary of Section 168.

Average rainfall in the area is approximately 22 inches per annum.

GEOLOGY, HYDROLOGY:

Bedrock of Archaean age, consisting of gneisses and schists with thin quartzites, occurs at shallow depth in the area. Outcrops occur near the northern boundary of Section 168 and near the western boundary of Section 170. A small outcrop of quartzite was also observed in the southern part of Section 174. These rocks are dipping easterly at angles of 70°-80°.

Overlying bedrock, particularly in the higher parts of the property is a variable thickness of clay, sandy clay and gravel with nodular laterite. These sediments are probably Tertiary in age and were deposited on a peneplained surface of the Archaean rocks. Erosion since the Tertiary has developed the present topography and exposed bedrock in certain areas. Alluvium of the gullies is derived by erosion of the lateritic mantle and of the Archaean rocks.

Water occurs at relatively shallow depth in the Tertiary sediments and is usually good stock quality, although supplies are generally small. A well, 33 feet deep, situated close to the eastern boundary of Section 169 is reported to yield 3,000 gallons per day or more. A water sample from this well was found to have a salinity of 70 grains per gallon, and it is therefore suitable for all stock. The water is apparently derived from local rainfall falling on the high ground east of the well. A proportion of the water eventually becomes groundwater and moves slowly westward. It is reported that a seepage occurs lower down the gully west of the well, as a result of a high water table following winter rains.

More permanent seepage occurs in the northern part of Section 168, where water emerges from near the base of the Tertiary sediments. This water is apparently quite saline, possibly because of impeded drainage and restricted intake from the higher ground to the south. The alluvium of the gullies is often very fine with a considerable proportion of clay, so that movement of the groundwater is restricted with consequent build up of the salinity. The shallow well in the gully north of the house on Section 169 yields water with a salinity of approximately 235 grains per gallon. This is good stock water but too saline for the watering of plants.

On Section 169 it is considered that additional stock supplies could be obtained by drilling in the gully to the west of the existing well. The site is shown on the accompanying plan. A depth of 25-35 feet would probably be necessary and if bedrock is encountered drilling should be discontinued. The schists and gneisses, which comprise bedrock in the area generally yield only small supplies of rather saline water. This is because the upper part of these rocks is usually highly decomposed, except where they are being actively eroded. The decomposition products, mainly clay, considerably restrict the entry and movement of water in the upper zone of the rocks.

On Section 168 it is considered that the best prospects of obtaining stock supplies is by drilling in the vicinity of the depression near the southern boundary. It is reported that surface water collecting in this depression drains away relatively rapidly, indicating that the sub-surface sediments are somewhat permeable. Drilling on the western side of the depressions is expected to yield a stock supply as it is considered that this is the direction of movement of the groundwater.

A depth of 25-35 feet would probably be necessary and the suggested site is shown on the plan.

On Section 174 which slopes generally toward the south west it appears that decomposed bedrock lies at relatively shallow depth. A bore drilled about $\frac{1}{4}$ mile north east of the house penetrated approximately 50 feet of white clay containing fragments of decomposed gneiss. Very little water occurred in the Tertiary sediments of this bore and it is considered that similar results would be obtained over much of the higher ground.

Decomposed bedrock was also encountered in the bore drilled in the well near the house. Further deepening of this bore is not recommended although it is reported that water under pressure was encountered. Cutting of the casing level with the base of the well may increase the supply slightly although the quality is not expected to improve. The salinity of the well water is 200 grains per gallon, while the supply is reported to be about 100 gallons per hour. It is therefore suitable for all stock but not for general domestic purposes.

Although supplies may not be large it is expected that better quality water would be obtained by drilling in the gully west of the house. Water should be encountered at shallow depth and may be suitable for domestic purposes. It is considered that somewhat larger supplies may be obtained at shallow depth in the gully trending westerly near the southern boundary of Section 174. An old well in this area, sampled in 1957, was found to have a salinity of 18 grains per gallon although the supply is not known. Limited irrigation supplies may be

obtained by sinking wells in this area and also in the extreme south west corner of Section 174.

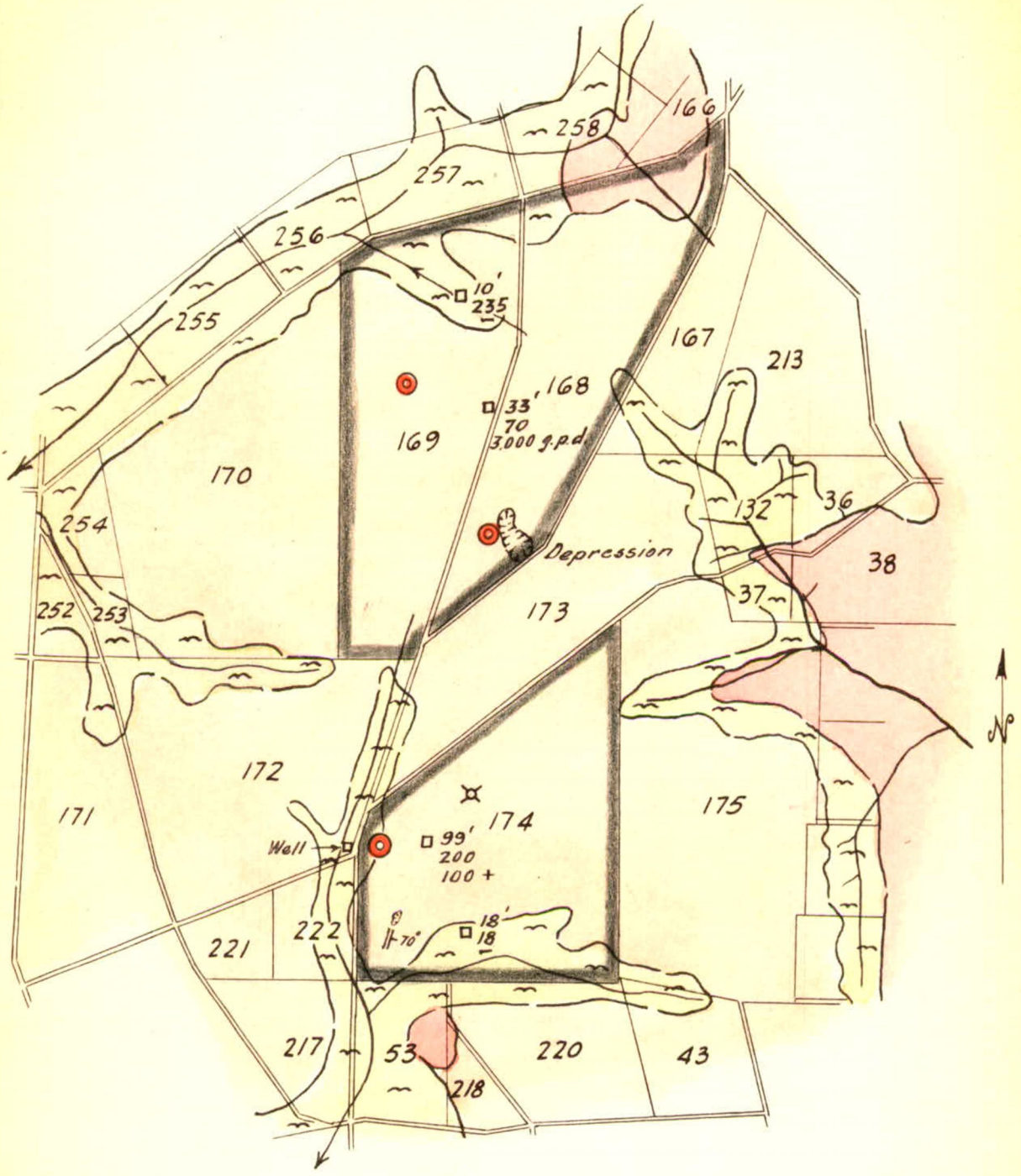
CONCLUSIONS & RECOMMENDATIONS:

Water suitable for stock should be obtained by drilling at the sites indicated on Sections 168 and 169 to a depth of 25-35 feet in the Tertiary sandy clay and gravel.

It is considered that water suitable for stock and possibly domestic purposes should be obtained at shallow depth in the gully west of the house on Section 174. Good quality groundwater probably also occurs along the gullies which join near the south western corner of this section. Supplies sufficient for limited irrigation may be obtained by sinking wells in this area. In all cases if drilling at the various sites indicates only very small yields the sinking of wells is recommended to increase the supply. Wells have a greater storage capacity than bores and the area of aquifer exposed is much larger.

R.G. Shepherd
Geologist
HYDROLOGY

RGS:AGK
2/4/59



RECENT: Alluvium

TERTIARY: Lateritic clay, sandy clay and gravel.

ARCHAEAN: Gneiss, schist and quartzite.

Suggested Bore sites

To accompany report by R.G. Shepherd

S.A. DEPARTMENT OF MINES

proved	Passed	Drn.	UNDERGROUND WATER SURVEY	D.M.	Scale 40 ch to 1"
		Tcd. A.W.	HD. LINCOLN	Req.	S2032
		Ckd.	SECS. 168, 169 & 174		On 13
irector		Exd.	G.J. & J.G. WHILLAS		Date 26-3-59