

Section



GROUNDWATER SURVEY

Hd. Kingston, Sects. 207-210 & 240-242 incl.

-A.D. Radford and Sons -

by

P.C. Smith

Department of Mines
South Australia —

73/302

DEPARTMENT OF MINES
SOUTH AUSTRALIA

GROUNDWATER SURVEY

Hd. Kingston. Sects. 207-210 & 240-242 incl.

- A.D. Radford and Sons -

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Rept. Bk. No. 73/302
G.S. No. 5806
Hyd. No. 2607
D.M. No. 1177/73

14th December, 1973

MICROFILMED

DEPARTMENT OF MINES
SOUTH AUSTRALIA

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GROUNDWATER SURVEY

Location

General: Approx. 8 km NNE of Mt. Bryan
Region: 3
County: Burra
Hundred: Kingston
Sections: 207-210 incl. and 240-242 incl.

Name of Property: "Little Hills"

Owner: A.D. Radford and Sons

Postal Address: "Little Hills"
MT. BRYAN, 5418.

Telephone: Mt. Bryan 17

Requirements

Water required for: Irrigation of 2.4 hectares of lucerne

Quantity: 3.8 litres/sec. (3,000 gallons per hour).

Quality: Less than 3,000 mg/l.

Other factors: Advice was sought on a bore drilled by W. Reed (driller, Hallett) which intersected very fine grained sand from 20-23 m. The applicants wished to determine whether to screen the above bore or find an alternative site where this "fine sand" problem would not exist.

HYDROGEOLOGICAL REPORT

Physiography and Land Use

The property lies on undulating country between 525 and 600 m above mean sea level. A number of minor ephemeral drainage lines with general flow directions varying from west on the upper slopes to south on the lower slopes occur in the property.

Sheep are grazed and crops sown. A ram shed is planned adjacent to the area required to be irrigated.

Climate

Nearest rainfall station: Mt. Bryan

Mean annual rainfall: 17.01 inches (432 mm).

Remarks on rainfall pattern: The mean monthly rainfall distribution over the past 67 years to 1964 has been in points (1 inch = 100 points):-

<u>Month</u>	Jan	Feb	Mar	April	May	June
<u>Points</u>	70	95	63	103	181	198
<u>Month</u>	July	Aug	Sept.	Oct.	Nov.	Dec.
<u>Points</u>	215	225	195	154	105	97

The mean annual rainfall falling on the property is expected to be slightly less than the above figure with however, a similar monthly distribution.

Surface Hydrology

Creek name: Unnamed ephemeral drainage lines.

Characteristics: The drainage lines generally with diffusely defined channels flow in a westerly direction on the upper slopes (eastern portion of the property) and in a southerly direction on the alluvial material (southern portion).

Springs: No springs were observed nor are known to exist on the property.

Surface storage: Surface storage is effected by means of tanks and troughs.

Geology

Soil Cover: Soil cover is complete over the portion of the property inspected. It is a silty, sandy soil type with a significant clay fraction.

Rock Units: Quaternary - alluvial deposits.

Proterozoic (Sturtian) - Appila Tillite - tillite and associated fluvio-glacial sediments.

Lithology: The only lithology observed was that of Quaternary age i.e. the alluvial slope deposits which constitute the "soil" cover described above. These sediments are expected to overlie Proterozoic tillites etc. by not less than several tens of metres in the vicinity of the bore recently drilled.

Direction and Amount of dip: Not applicable to the Quaternary deposits.

Structural Features: The Quaternary sediments were deposited in former erosional surface depressions, probably eroded during the Tertiary.

Aquifer Assessment

Type: Free water table. Water is stored in the pores between sediment grains. The grain size and degree to which the pores are infilled with fine material determine the ease with which water is extracted from the aquifer. In this case the grain size of the sand is too fine for conventional slotted casing thus necessitating the use of a screen and correct development to attain the full production capacity of the bore.

Potential Recharge: Recharge is effected by the infiltration of rainfall and the downward percolation of surface water from the drainage line.

Borehole Site Location

General: No new borehole site is suggested. The bore recently drilled to a depth of 22.9 m by Mr. W. Reed is recommended to be screened and developed. Contact has been made with Mr. Reed as to the correct procedure to be followed.

Reason for location: The bore is located adjacent to a significant drainage line with a large catchment area.

The relatively open nature of the soil cover allows good recharge to the aquifer in this case alluvial sands and gravels. Location of bore sites closer to the ranges although likely to encounter coarser sediments thus eliminating the "fine sand problem" suffer from inconvenience to the landholder and decreased recharge due to smaller catchment area.

Drilling and Testing Recommendations

Development Hazards: The instructions given to the driller both verbally and via literature should be followed stringently. Correct installation of the screen and proper development cannot be too highly stressed.

Sampling: Water samples should be taken at the commencement of development and at its completion. These can be collected in 26fl. oz. or 1 litre bottles and forwarded to this Department for analysis free of charge.


Pump Test: This service can be supplied by the driller and/or pump distributor if warranted by the result obtained after development.

Summary

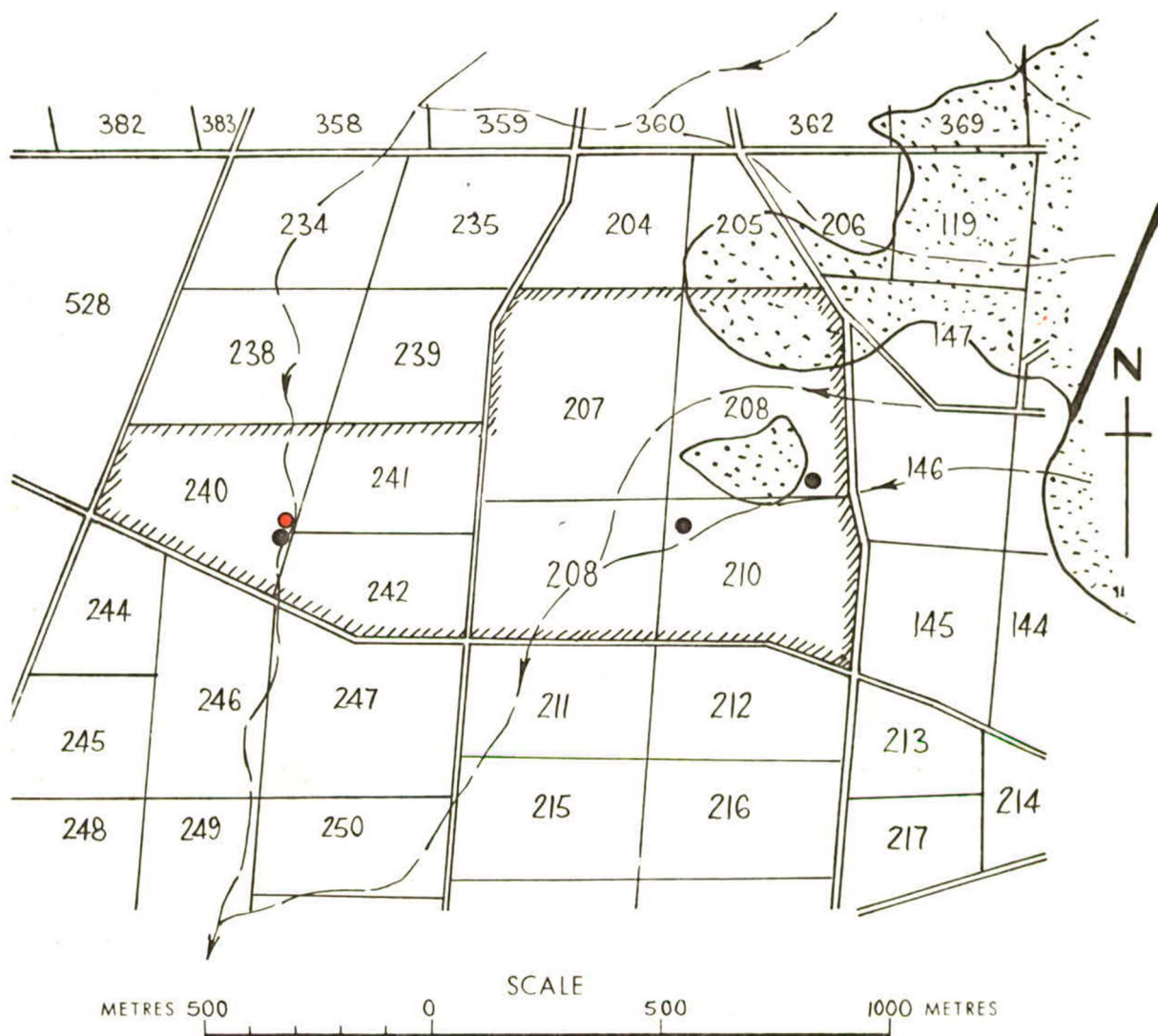
A portion of the property was inspected geologically and the decision made that the bore already drilled is in a suitable hydrogeological environment.

It is suggested that a screen be installed and the bore developed so as to attain optimum performance. Contact can be made with the Hydrogeology Section of this Department if further advice is required.

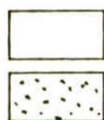
PCS:CF
14th December, 1973


P.C. SMITH B.Sc.(Hons.)
GEOLOGICAL ASSISTANT

Survey Date: 5.12.73.



LEGEND



Quaternary - stream alluvium

Proterozoic (Sturtian) - Appila tillite - massive boulder tillite with intercalations of quartzite and flurioglacial shale

Strike and dip of bedding 60
 Strike and dip of jointing 50
 Strike and dip of foliation 35
 Strike and dip of cleavage 45

Geological boundary
 Fault line
 Drainage lines
 Surface storage
 Existing borehole
 Well
 Spring
 Abandoned borehole
 Proposed borehole

Existing borehole
 Well
 Spring
 Abandoned borehole
 Proposed borehole

Existing borehole
 Well
 Spring
 Abandoned borehole
 Proposed borehole

DEPARTMENT OF MINES - SOUTH AUSTRALIA

HYDROGEOLOGY SECTION

Compiled. *P.C. Smith*

Drn. *D.J.M.*

Ckd.

GROUNDWATER SURVEY

SECS. 240, 241, 242, 207, 208, 209, 210 HD. KINGSTON

A.D. RADFORD & SONS

Date. 5 NOV. '73

Drg No.
S10614
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