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Rept. Bk. 57/79
G.S. 2731
HYD. 1504

DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
HYDROLOGY SECTION

PODDA BASIN

QUARTERLY PROGRESS REPORT

PERIOD ENDING 30th SEPTEMBER, 1963

by

R.G. SHEPHERD

DM.1474/62

6/11/63

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Section

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DEPARTMENT OF MINES
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POLDA BASIN QUARTERLY PROGRESS REPORT FOR PERIOD ENDING 30th SEPTEMBER, 1963.

INTRODUCTION:

Test drilling in the Polda area has been continuous throughout the period, using two drilling plants. Bores have now been drilled at 1 mile intervals along the main road as far west as Bramfield and for about 9 miles north of Mount Wedge. The total number of bores now drilled is 206, of which 47 were drilled during this period. Because of the very wet conditions, this number is considerably less than in the previous period.

Pumping from the trench recommenced in September at the rate of about 42,000 g.p.h., which has caused a local lowering of the water table.

DRILLING RESULTS:

Good quality groundwater of less than 1,000 p.p.m. has been found to occur over an area of about 50 square miles in the vicinity of Polda. To the west, for a distance of about 12 miles along the main road, the salinity exceeds 1,000 p.p.m. A number of bores situated along the fringe of the salt water area of Poolpona Swamp, and in the vicinity of Mt. Wedge, penetrated water of more than 7,000 p.p.m.

Drilling south of Mt. Wedge near the Polia - Pinline hundred boundary has shown that salinity of the groundwater increases with depth. Salinity of the top water varies from 1,140 to more than 5,000 p.p.m., while the lower part of the aquifer contains water of up to 9,000 p.p.m.

Northwards from bore 178, which is about two miles north-east of Mt. Wedge, good quality water apparently occurs over a considerable area; a number of bores encountered water with salinity less than 700 p.p.m. Bores 182, 183 and 185 are apparently close to the margin of the basin, where the aeolianite is thinner and contains a considerable proportion of clay.

Salinity of the water in these bores varies from 1,700 to almost 2,000 p.p.m., with underlying brackish water exceeding 7,000 p.p.m. Several miles to the north, bore 190 penetrated water of almost 4,000 p.p.m.

South-west of Mt. Hedge, in the direction of Bramfield, the salinity of the groundwater varies from 2,000 to 4,000 p.p.m. for the first three miles. Beyond this distance there is a marked improvement in quality, the salinity generally being less than 700 p.p.m.

Over most of the area water has been found to occur at shallow depth, and rarely deeper than 50 ft., particularly in the low-lying parts where water often occurs at less than 15 ft. below the surface.

During the period, a number of bores were also drilled in the vicinity of the trench, in order to find a deeper section of the basin where large diameter bores could be drilled for pump tests. A total of 14 bores were drilled at about 200 yard intervals, but they did not prove any greater thickness of aquifer than was already known from previous drilling.

A 16 in. bore hole had been drilled in the vicinity of bore 6, and it was decided to carry out pump tests at this site. The bore yielded 10,000 g.p.h. with a drawdown of 7'6" while the trench a short distance away was being pumped at the rate of about 42,000 gallons per hour.

Subsequently, a pump test was also done on another bore situated about three miles south-west of the trench. From this bore, a yield of 20,000 g.p.h. was obtained with a drawdown of about 10 ft. Results of the pumping tests will form the subject of a separate report.

Water table contours for the period show a marked rise following the heavy winter rain. Although figures for July are the latest available, they indicate a rise in the water table of up to 3 ft. since pumping was temporarily suspended in April. Since pumping has recommenced, the water table has probably declined but is probably still above the level of December, 1962.

Variations in the water level in an area just east of

the trench are shown by a hydrograph of bore 30. The graph shows a general decline in water level from R.L. 224.4 at the 4th December, 1962, to a minimum of 222.5 at the 24th April, 1963. It was during this period that pumping was in progress from the trench, and it was temporarily suspended on 26th April, 1963. After this date, there was a marked rise in the water table and by the 12th June, it had risen to 224.5 and four weeks later, it was 225.8.

No further drilling has been done along the Tooligie - Sheringa road, but it is intended to resume in the central part of the Hundred of Pearce, where good quality water is known to occur. From this area, it is intended to drill northwards towards Kappawanta, and eventually west into the Hundreds of Hudd and Ward.

During the period some geophysical testing was done in the vicinity of the trench. The object of this work was to assist in determining the structure of the basin, including depth to the underlying clay and the water table. The resistivity method used appears to be quite promising and it is intended to run a series of traverses over a number of bores south of the trench. This is expected to be of considerable assistance in determining the structure of the basin in that area.

CONCLUSIONS:

Up to the end of September, 1963, a total of 206 observation bores have been drilled in the Polda - Bramfield area. Results of drilling indicate that good quality water of less than 1,000 p.p.m. occupies an area of about 50 square miles in the vicinity of Polda.

To the west, there is an area of brackish and saline groundwater where salinities rise to more than 10,000 p.p.m. in some areas. This zone of poor quality water is known to extend west as far as Mt. Wedge, and for several miles north and south of the main road. Good quality water with salinity usually less than 700 p.p.m. has been obtained in a number of bores north-east of Bramfield, and also north-east of Mt. Wedge.

Levels of water table have shown a marked rise, following the temporary cessation of pumping in April and the heavy winter rain. At the close of the period, pump tests were done on two bores and yields were relatively large with only small drawdowns. Results indicate that bores are probably preferable to the trench for pumping purposes.

Some geophysical work done in the area shows promise of being a useful additional tool in determining the structure of the basin.

R. G. Shepherd

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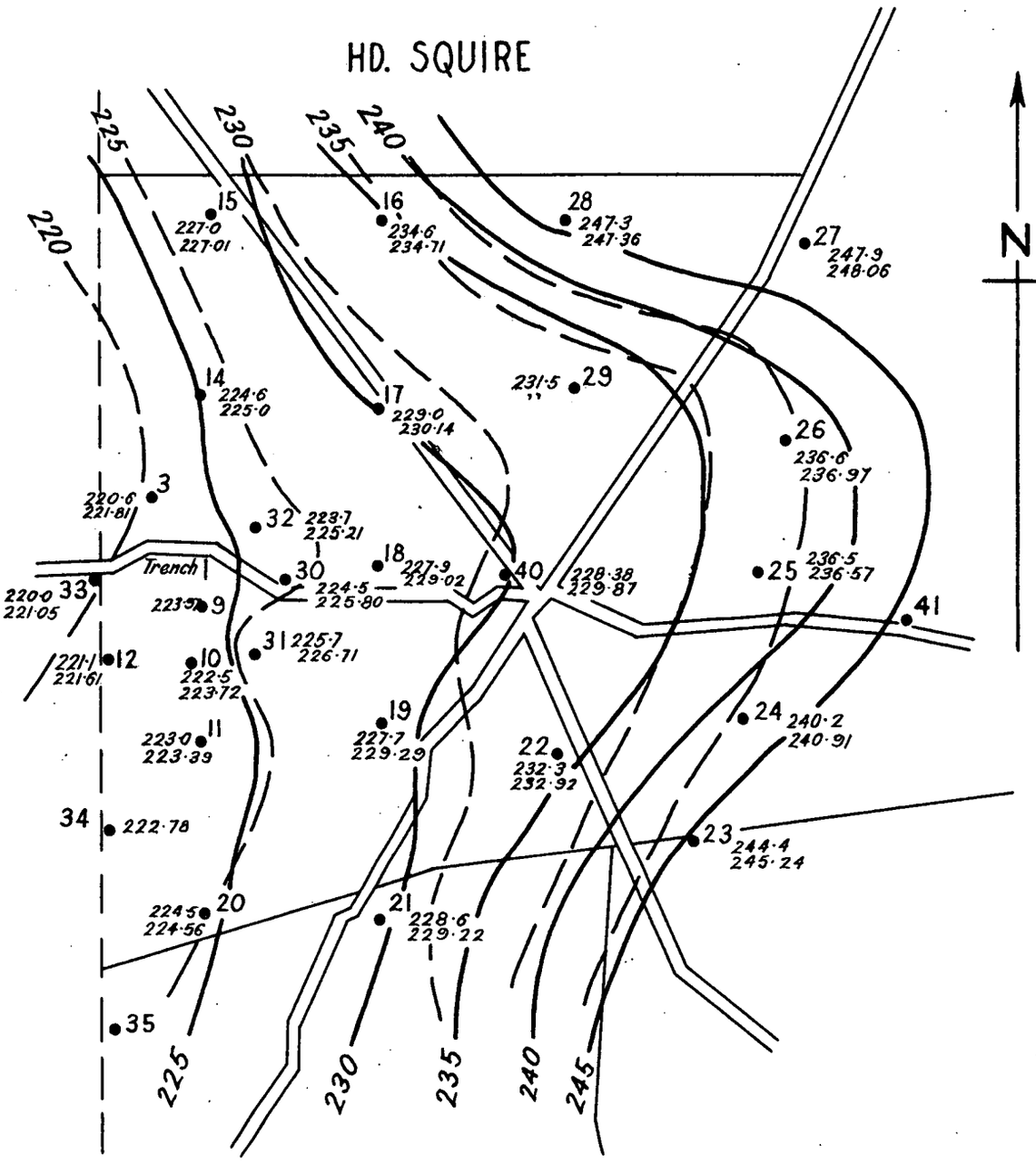
RGS:EMD
6.11.63.



Observation bores, with number • 19 227·7 R.L. OF WATER TABLE AT 17·6·63
229·29 " " " " 10·7·63

Water table contours at 17·6·63 — — —
" " " " 10·7·63 ———

MILES 0 1 2 3 4 MILES

To accompany report by R.G. Shepherd

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn.	POLDA BASIN	D.M.	Scale 1 mile to 1 inch.
		Tcd. B.F.	Water Table Contours at 17·6·63 & 10·7·63	Req.	S 3526 D1 2/4
		Ckd.			
Director		Exd.			Date 30·10·63

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