Rept. Bk.56/1
G.S. 2513
HYD. 1404

DEPARTMENT OF MINES
SOUTH AUSTRALIA

GEOLOGICAL SURVEY
HYDROGEOLOGY SECTION

POLDA BASIN

PRELIMINARY REPORT FOR PERIOD ENDING 21/12/62

by

R.G. SHPHERD

DM.1474/62

3rd January 1963

Sections

DEPARTMENT OF MINES
SOUTH AUSTRALIA

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POLDA BASIN

1st Quarterly Progress Report Period Ending
21/12/62

Introduction:

Drilling of observation and test bores commenced with one plant on 28th September 1962. Later, on 13th November, a second plant commenced operations. The first 8 holes were test bores to determine the thickness of theaquifer in the vicinity of the existing trench. Later, observation bores were established at distances of up to four miles from the trench. Most of these were drilled in the vicinity of old test bores. A total of 35 observation bores have been drilled to date and 2 are in progress.

For several weeks at the end of the period both plants have been used to drill blast holes along the line of the new trench, at 12 feet intervals. By the end of the period approximately 40 blast holes to an average depth of 20 feet will have been drilled.

The plan accompanying this report shows the location of observation bores drilled to date.

Drilling Results:

In the vicinity of the northern end of the trench the base of the upper aquifer lies at a depth of 16 feet as shown in No. 1 bore. Test bores were then drilled at 25 yard intervals southward to No. 5 bore, where the thickness of the upper aquifer increased to 24 feet. Approximately 100 yards further south bores 6, 7 and 8 showed a thickness of up to

32 feet. To the south in bores 9, 10, 11 and 20 the aquifer varies from 27 to 32 feet in thickness.

Elsewhere the thickness varies from 12 to 30 feet with water generally occurring within 10 feet of the surface.

The aquifer consists of calcareous sand normally with two dense limestone beds one at the surface and a second discontinuous bed at a depth of 10 - 12 feet. The thickness of both beds vary but are normally less than 7 feet.

The base of the upper aquifer consists of a yellow brown sandy clay grading to a clayey fine sand and silt. Few bores have been drilled through this horizon but it is apparently continuous and probably has a thickness of at least 10 feet within the area tested.

At present two bores (Nos. 35 and 41) are in progress to test the deeper water; in both, the clay horizon exceeds 10 feet in thickness. Beneath the clay there are alternate thin beds of sand and clay, lignitic in part and yielding brackish water under pressure. In bore 35 the first water occurred at 55 feet rising to 40 feet from the surface. Brackish water occurs at 80 feet, static level being 65 feet and also at 140 feet with a static of 35 feet.

These deep bores will be back filled with clay to the base of the upper aquifer in order to prevent salt water entering the good water zone near the surface.

Salinity:

Generally the salinity of the upper aquifer varies from 33 to 80 grains per gallon with often a slight increase, of 5 - 7 grains, from top to bottom of the aquifer. Water occurring in sands at greater

depth exceed 100 grains and there is a marked increase in salinity with depth. In bore No. 14 water of 142 grains per gallon was encountered in sand at a depth of 33 feet; water of the same salinity was found in bore 35 at 80 feet. In the latter bore water of 324 and 542 grains occurs in sand at depths of 140 and 215 feet respectively.

The only brackish water encountered at shallow depth was in bore No. 13, situated on the margin of Peelpena Swamp. In this bore water of 630 grains per gallon was obtained at 10 feet, rising to 698 grains at 25 feet. The water occurs in a thin bed of limestone associated with yellow, brown and red sandy clay, these sediments being similar to those occurring at the base of the upper aquifer. The Peelpena Swamp is a low lying area in which calcareous sand and associated limestone has not been deposited. The shallow saline groundwater occurring within the swamp appears to be separate from the main area of fresh groundwater and is not expected to influence the quality of the water to be pumped from the trench. Several additional bores will be drilled in the vicinity of the swamp to determine the extent of the saline groundwater.

Commission:

Up to the end of the quarter, 35 observation bores have been re-established and fitted with 2½" water pipe to enable water level measurements to be taken. At present, levelling of the bores is in progress by an E. & W.S. surveyor. Measurements of water levels have been commenced by E. & W.S. personnel so that water table contours can be drawn for the period prior to commencement of pumping.

When pumping commences a monthly check of

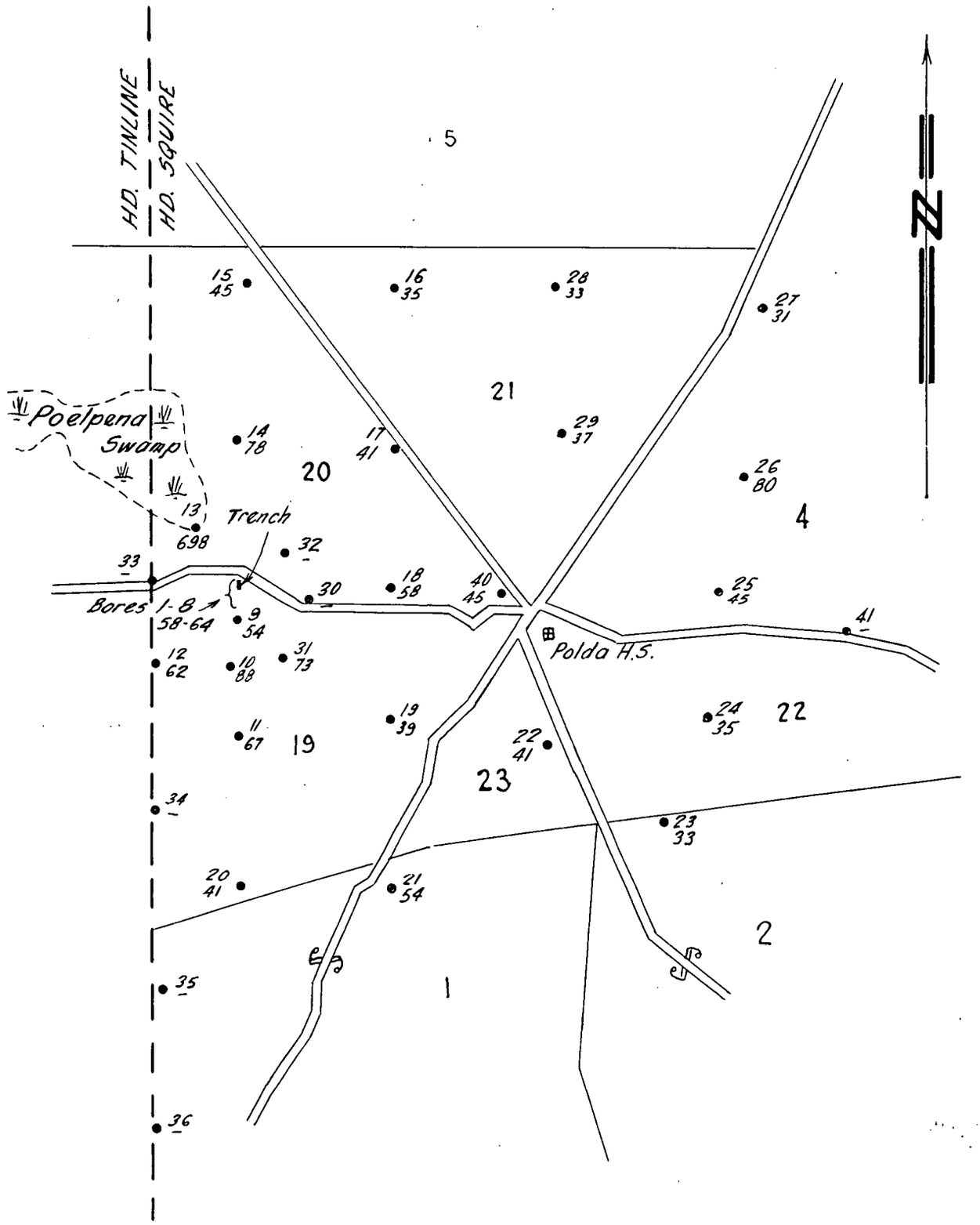
water levels will be made on all observation bores and those within 1 mile of the trench will be read weekly.

It is proposed to continue drilling of observation bores at approximately 1 mile intervals in the vicinity of Folds. Following a detailed hydrological survey of the greater part of County Musgrave during the period January-February 1963 test drilling will be extended, based on the results of the survey.

R. G. S.

R.G. Shepherd
Geologist
Hydrology

RGS:PB
3rd January, 1963.



Observation bore • 23 Number
33 Salinity in gr./gall.
(Top water.)

To accompany report by R.G. Shepherd.

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn.	POLDA BASIN	D.M.	Scale 1" to 1 mile.
		Tcd. M.B.L.	Hd. Squire	Req.	S 3313
		Ckd.	Location of Observation Bores		D1 2/4
Director		Exd.	Period ending 21·12·62		Date 20·12·62

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