Rept.Bk. 59/103
G.S. 2999
D.N. 670/64
Hyd. 1629

DEPARTMENT OF MINES
SOUTH AUSTRALIA

TESTING AND FLOW CONTROL OF BORES IN THE GREAT ARTESIAN BASIN.

Progress Report No. 1

PLAN: 64-969

INTRODUCTION

Six bores along the Marree-Birdsville stock route have been prepared as Observation bores with valves and pressure points fitted. The static head can be measured by shutting in the bore and recording the pressure. Flow and pressure measurements can now be taken annually with little preparatory work. Four of these bores, namely Cammerwaukaninna, New Koppermanna, Mirra Mitta, and Pandie Burra have been fitted with orifice plates to control the flow.

TEST RESULTS

Frome Creek Bore

Grid J4, PS 12N, PL 1770, Block 916.

Depth: 369'
Tested on: 13/10/64
Static pressure: 34.5 p.s.i.
Temperature: 86°F.
Flow: 380 gallons per hour (no pressure on head)
Orifice plate: Not fitted
Remarks: 200 yards of 2" galvanised pipe to trough thence to windmill. Excess water forms pool in creek.

Lake Harry Bore

Grid J4, PS 12N, PL 1946, Block 1040.

Depth: 1360'
Tested on: 13/10/64
Static pressure: 64 p.s.i.
Temperature: 118°F.
Flow: 2,500 gallons per hour (no pressure on head)
Orifice plate: Not fitted.

Remarks: 2 - 2" valves and pipe to troughs, one trough ½ mile north, second trough 100 yards west. 3" rubber seat valve and 3" pipe. Subsequently fitted with plastic pipeline by lessee.

Cunnamunkaninna Bore - Tadunna Station

Grid J4, PS 12N, PL 1681, Block 751.

Depth: 2847 feet

Tested on: 14/10/64

Static pressure: 125 p.s.i.

Temperature: 172°F.

Flow: 22,000 gallons per hour (no pressure on head).

Orifice plate: 1" diameter orifice fitted.

Flow through orifice: 8,700 gallons per hour
80 p.s.i. on head

Remarks: Double gate head modified and fitted 1 - 4" rubber seat valve. Short drain to creek. No attempt to maintain drain or to restrict water to single source in creek. The flow of 209,000 gallons per day is sufficient for 40 miles of bore drain in good condition and to water 2,000 head of cattle (allowing 90% wastage).

New Koonaramanna Bore - Tadunna Station

Grid J3, PS 16S, PL 1681, Block 751.

Depth: 3256'6"

Tested on: 16/10/64

Static pressure: 138 p.s.i.

Temperature: 180°F.

Flow: 21,000 gallons per hour (no pressure on head).

Orifice plate: ¾" diameter orifice fitted

Flow through orifice: 5,400 gallons per hour
117 p.s.i. on head.

Remarks: Removed head and fitted 3" valve and pipe. Water from drain spreads out into Coopers Creek forming large pools. Flow of 130,000 gallons per day is sufficient for 27 miles of bore drain in good condition and to water 1,300 head of cattle. (Allowing 90% wastage).

Mirra Mitta Bore - Cowarie Station

Grid J2, PS 168, PL 1935, Block 778.

Depth: 3534'

Tested on: 17/10/64

Static pressure: 125 p.s.i.

Temperature: 194°F.

Flow: 22,400 gallons per hour (no pressure head).

Orifice plate: 27/32" diameter orifice fitted.

Flow through orifice: 6,200 gallons per hour
88 p.s.i. on head.

Remarks: Double gate head modified and 1 - 4" valve fitted. Water drains into creek forming swamp. The flow of 148,000 gallons per day is sufficient for 29 miles of bore drain in good condition and to water 1,400 head of cattle (allowing 90% wastage).

Pandie Pandie Bore - Clifton Hills Station

Grid K1, PS 15N, PL 1601, Block 827.

Depth: 7253 feet (casing fractured at 4570 feet)

Tested on: 21/10/1964.

Static pressure: 165 p.s.i.

Temperature: 210°F.

Flow: 17,000 gallons per hour (no pressure on head).

Orifice plate: ¾" diameter orifice fitted

Flow through orifice: 6,000 gallons per hour
120 p.s.i. on head.

Remarks: Head turned through 180° and 75' pipe fitted to prevent water flowing back around head. Water flows to drain and then spreads out forming swamp. The flow of 144,000 gallons per day is sufficient for 28 miles of drain in good condition and to water 1400 head of cattle (allowing 90% wastage).

The flow from this bore was previously recorded at 6,000 gallons per hour after completion as a water producer, but had increased to 17,000 gallons per hour.

SUMMARY AND CONCLUSIONS

The initial programme of testing and establishment of Observation bores was successful and should allow annual measurement

to be made with little preparatory work. Two of the bores are more than 60 years old but were sound enough to withstand the high static pressures measured by shutting in the flow. The static pressures recorded showed a gradual increase northerly from 345 p.s.i. at Frome Creek to 165 p.s.i. at Pandie Burra. New Koppermanna Bore is the only one with a previous pressure recording (155 p.s.i. from late 1949 or early 1950) and shows a drop of 17 p.s.i. over 14 years. Successive readings on these six bores and other bores throughout the basin especially these fitted with orifice plates will allow an estimation of the maximum yield which will produce little or no annual decrease in static pressure.

Where orifice plates have been fitted water is released at least 3 to 4 times the rate that would be allowed for a similar length drain in Queensland or New South Wales. Cannawaukaninna Bore, which is reported to have a 12 mile bore drain, would be allowed 60,000 gallons per day instead of the present 209,000 gallons per day. In each case where an orifice plate has been fitted, sufficient water is released for 1,200 to 1,400 head of cattle after allowing a 90% water loss through soakage and evaporation.

E.R. Hillwood

ERH:AGK:EMD:AWK
16.11.64

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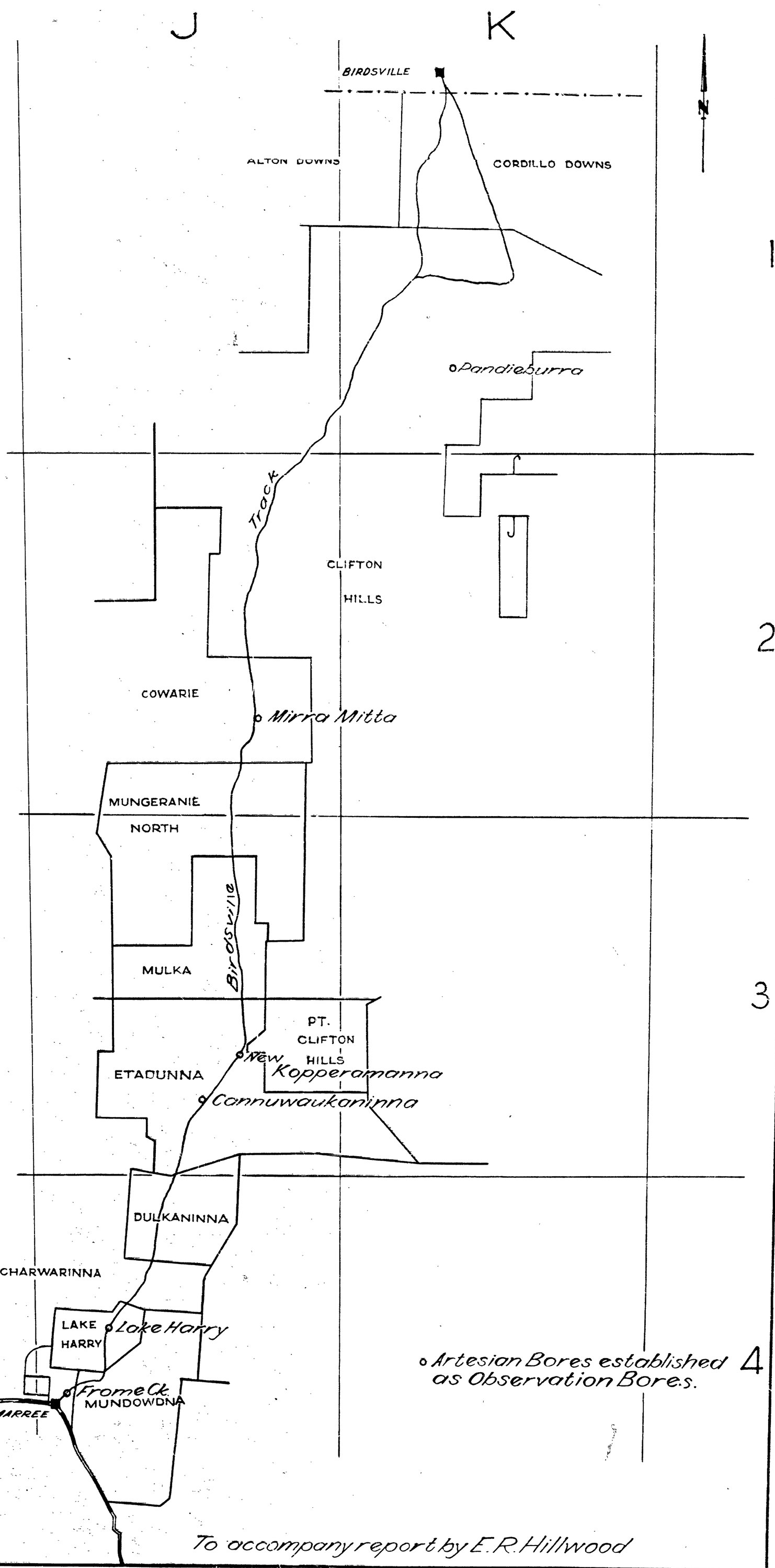
GEOLOGIST.
HYDROLOGY



o Artesian Bores established as Observation Bores.

To accompany report by E.R. Hillwood

S.A. DEPARTMENT OF MINES

No.	Amendment	Exd.	Date

GREAT ARTESIAN BASIN

MARREE BIRDSVILLE STOCK ROUTE BORES

TESTED DURING PERIOD 12·10·64 *to* 22·10·64

Approved	Passed		Scale : 20m. to 1"
		Drn.	64-969
		Tcd.G.M.	Cac
		Ckd.	
Director		Exd.	Date 28·10·64

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