Spare C Bleys

DEPARTMENT OF MINES
SOUTH AUSTRALIA
GEOLOGICAL SURVEY

PROGRESS REPORT NO. 1

GREAT AUSTRALIAN ARTESIAN BASIN

LEVELLING OF FLOWING BORES

by

C.W. FRYTERS
SURVEYOR
DRAFTING SECTION

27th June, 1967

D.M. 477/67

64/124

DEPARTMENT OF MINES
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R/B 64/124

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CONTENTS PAGE

SURVEY EQUIPMENT

Level Books 389, 390
Field Books 501, 502
Watts Level No.1
2 wooden staffs and bubbles
2 350 feet cables.

Rept.Bk.No. 64/124
G.S. No. 3736
Hyd. No. 1903
D.M. 477/67

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INTRODUCTION

Before the Department of Lands established permanent level bench marks in the far north of this state, attempts had been made to level some of the flowing bores using bench marks put in by Oil Companies or private surveyors. Good results were hard to achieve since it was not known how the majority of the bench marks were established nor on what datum they were fixed.

The first attempt, in this department, to co-ordinate the levels in the north was made by M.B. Langsford and J.B. Anderson in July, 1963. An unpublished report was put out on their findings showing the various sources of information. A minute in DM229/52 by M.B. Langsford who describes their findings and states that most of the existing levels were unreliable. Partly for this reason, a survey party was sent to level from Lyndhurst to Beetota to give some vertical control in this area. Due to an accident involving the vehicles, the results of this survey were not published until this year. Since then, a third order level traverse, by the Lands Department, has been completed from Lyndhurst to Innamincka. The results from this survey showed that large discrepancies in level existed in this area. For example, the previous level for Murnpeowie bore was 336 ft.

whereas the latest figure gives it as 272.4ft.

Similar discrepancies have been found along the Birdsville track, although the error there is not so great in places. This can be seen from the list below.

Bore	Previous Level	New Level	Error
Dulkaninna (J/4 no.4)	135	125.08	+9.92
Clayton (J/4 no.2)	151	148.30	+2.70
Lake Harry (J/4 no.7)	148	146.74	+1.26
Frome Ck. (J/4 no.11)	126	146.38	-20.38
Tarkaninna (J/4 no.3)	180	173.49	+6.51
Lake Lettie (I/4 no.5)	30	56.28	-26.28

As can be seen, the error is not consistent in value nor sign.

With the establishment of third order level bench marks along the Strzeleckie and Birdsville tracks and from Marree to Oodnadatta to Alice Springs, levelling of the G.A.A.B. flowing bores has been simplified. Most of the bores are within reasonable distance from a bench mark and enough bench marks exist to enable closures to be made without involving too much extra work. A few bores are such a distance away from B.M. that levelling them would take a considerable amount of time. It has been suggested that these bores should be levelled using altimeters to obtain an initial level. If enough care and control is used, the altimetric heights should be within 5ft. of the true level.

At this stage, it is foreseen that one area, east of Lake Frome, may cause some difficulty to level. The bores here are scattered about and not much level control of high order exists. Unless requested, this area will be left until last in the programme. It is hoped that the programme can be completed

in five trips, each trip consisting of six weeks duration. At the moment, the second trip is in progress and arrangements for the third trip will be started soon.

The state map attached shows the extent of the present proposed survey project, the red denoting bores which have yet to be levelled and yellow denoting bores which have been levelled on this first trip.

All reduced levels quoted in this report refer to M.S.L = 0 at Port Adelaide.

FIELD WORK

The first trip undertaken left Adelaide on 27.2.67 and returned on 5.4.67. A total distance of 290 miles was levelled, incorporating 35 flowing bores and 8 non-flowing bores. When levelled, each bore was photographed to show condition of bore head and place where level reading was taken on bore head. A 2" x 2" wooden bench mark was also established close by the bore in case the casing was shifted and the bore had to be relevelled.

For every three days of levelling, one day was spent scouting the area to locate the bores and to find which was the best access to the bore. Sometimes up to four hours were spent looking for one bore.

Bores J/4 no. 71 and 72, both of which are listed as flowing bores, have been abandoned. Bore 71 never had any water in it to begin with and bore 72 has a very small flow of salt water. Bore I/4 no. 7, also listed as a flowing bore, has been abandoned and buried in for the last 15years. Bore J/4 no. 13, the old railway bore, has been abandoned and buried in and

replaced by J/4 no. 15.

The first loop levelled consisted of bores J/4 nos. 15, 16 and 17, closing the loop back onto BM1701. The distance covered was 2.3 miles with a misclosure of 0.10ft. which is reasonable considering the two staffmen had to be shown what to do and get use to doing it.

The second loop started on BM1701 and consisted of bores J/4 nos. 12, 9, 6, 7 and BM1367. The total distance was 22.9 miles with a misclosure of 0.07ft. Although this Misclosure is extremely small, it must be remembered that errors along the traverse could have cancelled one another out to give this closure. The only way to check this is to relevel the loop in the opposite direction, but since this is time consuming and the order of accurecy is not required for this project, levelling was only carried out in one direction.

The third loop consisted of BM1363 and bores J/4 nos. 20, 23, 25, 26, 19, 76 and BM1701. A misclosure of 0.67ft. occurred in the 30.5 miles traversed. The larger misclosure here is believed to have been caused by poor weather conditions while levelling from BM1363 to J/4 no. 20. A sandstorm blew up and after an hours levelling work had to be abandoned for the rest of the day. Also, when closing back to BM1701, it rained for a while. These extreme changes in weather could have effected the work by having different accuracies in reading the staff. The fourth loop was continued from the third loop and the large 0.67ft misclosure had no effect on it, making me believe that the error is mainly between BM1363 and J/4 no. 20.

The fourth loop, the largest one undertaken, started at BM1701 at Marree and finished at BM3436 at Murnpeowie Homestead. The bores picked up were J/4 nos. 76, 19 and 23 (in

third loop) then J/4 nos. 22, 65, 21, 35, 34, 33, 37, 29, 31, 32, 30 and K/4 nos. 5 and 12. Total distance covered in the loop was 140.6 miles with a misclosure of 0.53ft. Here again, errors must have compensated out along the traverse to obtain such a small error.

The fifth loop traversed from BM1371 to J/4 nos. 2, 3, 5 and BM1373 for a total distance of 27.3 miles and misclosure of 0.10ft.

The sixth and ~~first~~ final loop, levelled in bores J/4 nos. 9, 75, I/4 nos. 5, 6, 8 and 25 for total distance of 57.4 miles and a misclosure of 1.03ft. This loop branched off loop two north of J/4 no. 9 and traversed to I/4 no. 25 via J/4 no. 75, I/4 no. 8, closing back onto BM1705. Bore I/4 no. 5 and 6 are actually the beginning of a separate loop which has to be completed on the next field trip by levelling from BM1712 to I/4 nos. 18, 17 then 6. This reduces the sixth loop to 36 miles with a misclosure of 1.03ft. which is large compared to the rest of the survey. The larger misclosure could be due to the extreme heat and hilly terrain encountered between J/4 no. 75 and I/4 no. 25.

Other bores levelled individually were J/4 nos. 4 and 11 and I/4 no. 26. These bores were close to existing Lands Department bench marks.

Although levels for the bores surveyed are quoted to 0.01ft., accuracy of each level depends on the misclosure of the loop in which it was levelled, for example, in loop three, misclosure was 0.67ft., so the accuracy of bore J/4 no. 25 is ±0.34ft.

CWF:CAE
27.6.1967

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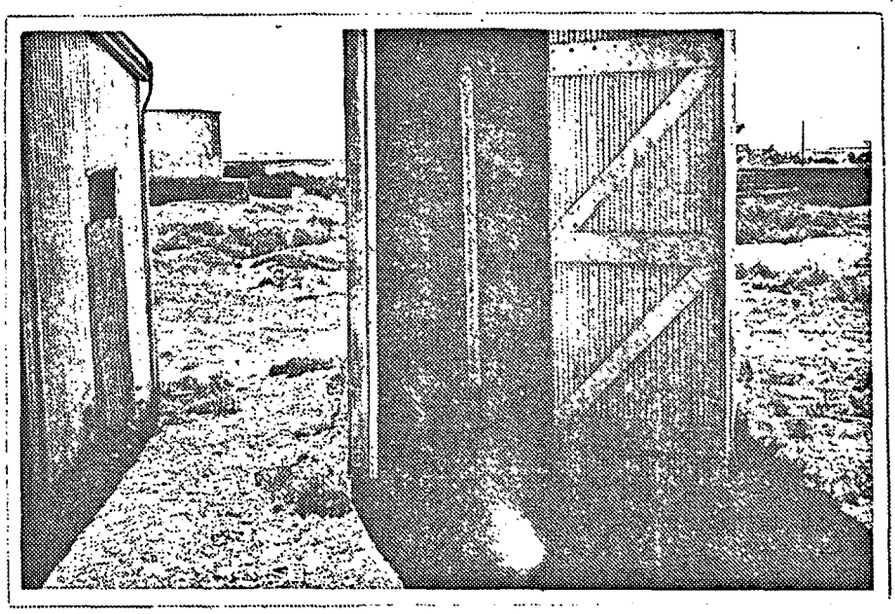
CONDITION OF BORES

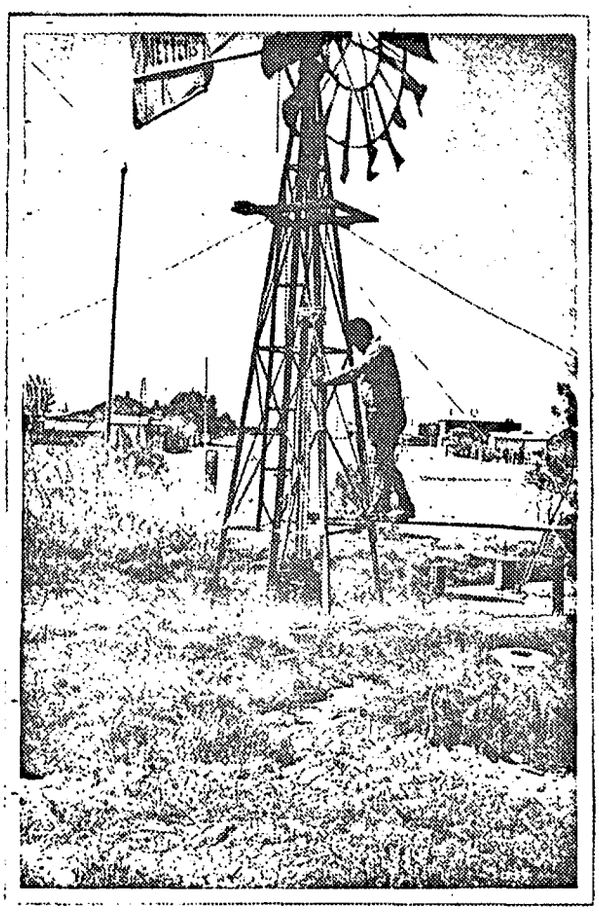
CONDITION OF BORES

Each bore visited was photographed, using a 35mm camera, primarily to show where the level reading was taken. However, the photographs also show the head and the condition of the bores. The photographs and a short description of the bore, are shown below.



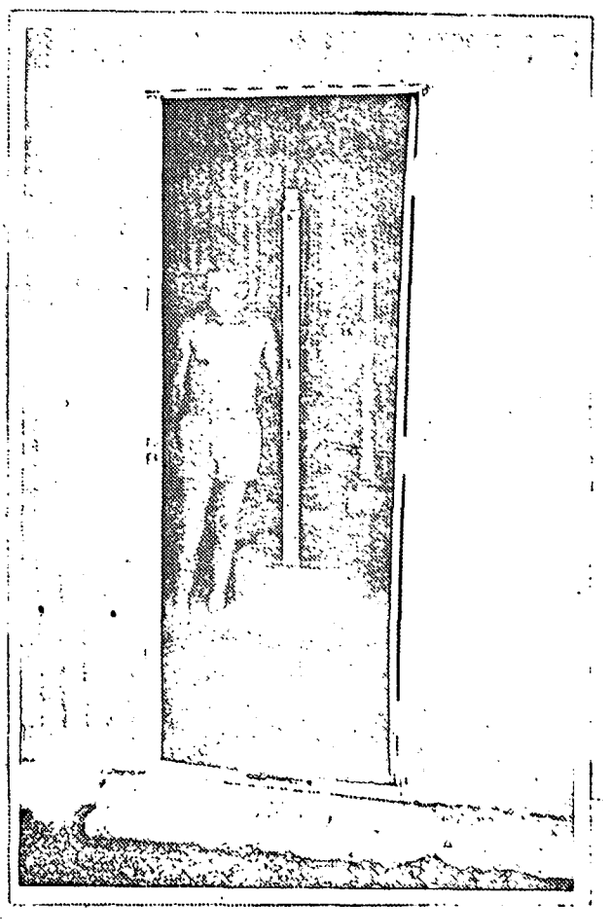
J/4 no. 15. (104000015) Marree Railway Bore. Pamona pump. Good condition but no flow

15940



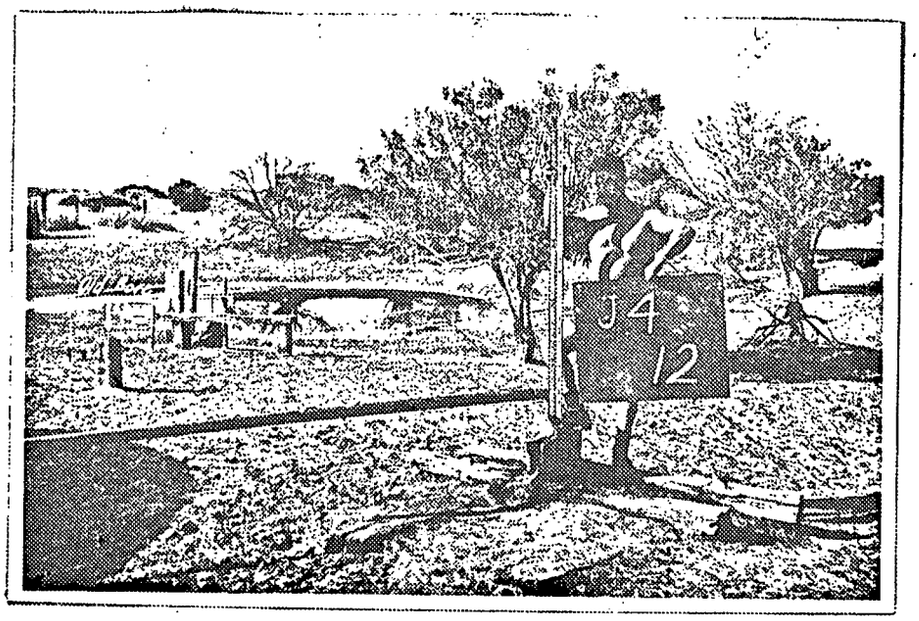
15941

J/4 no. 16, Abdul Bore (104000016). Poor condition with small flow.



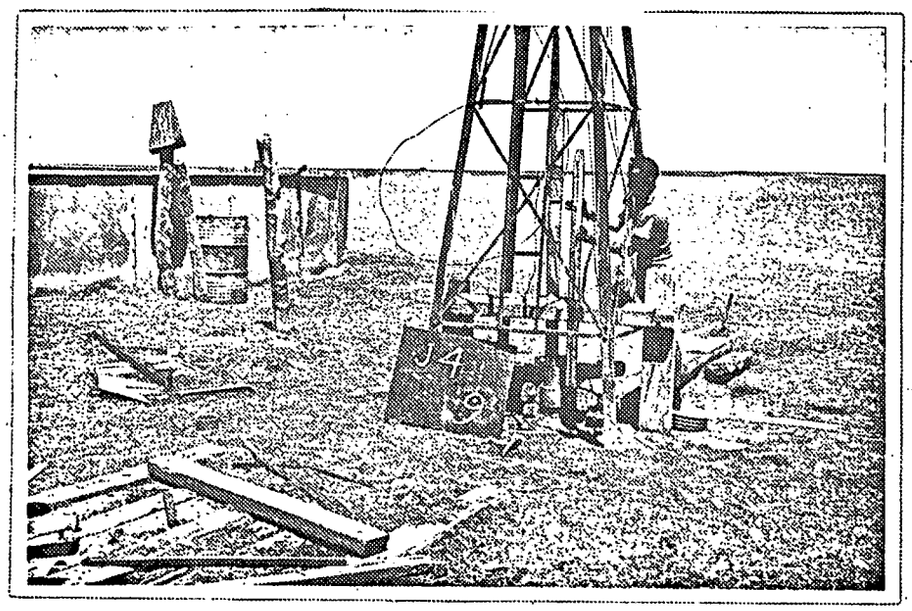
15939

J/4 no. 17, Marree No. 1 bore. Good condition but no flow (104000017).



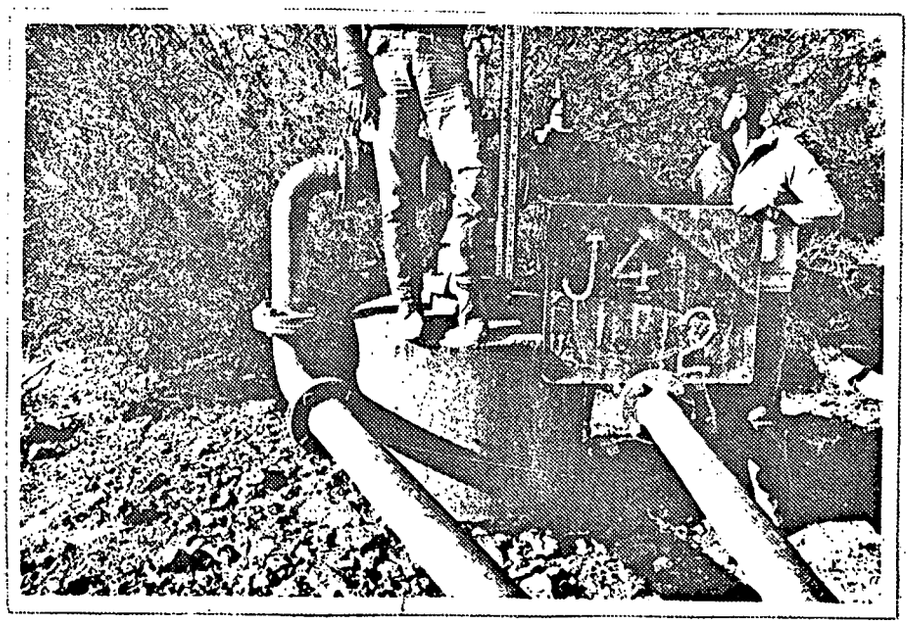
J/4 no. 12, (104000012) Hergott Springs Bore. Condition poor, flow very small

15934



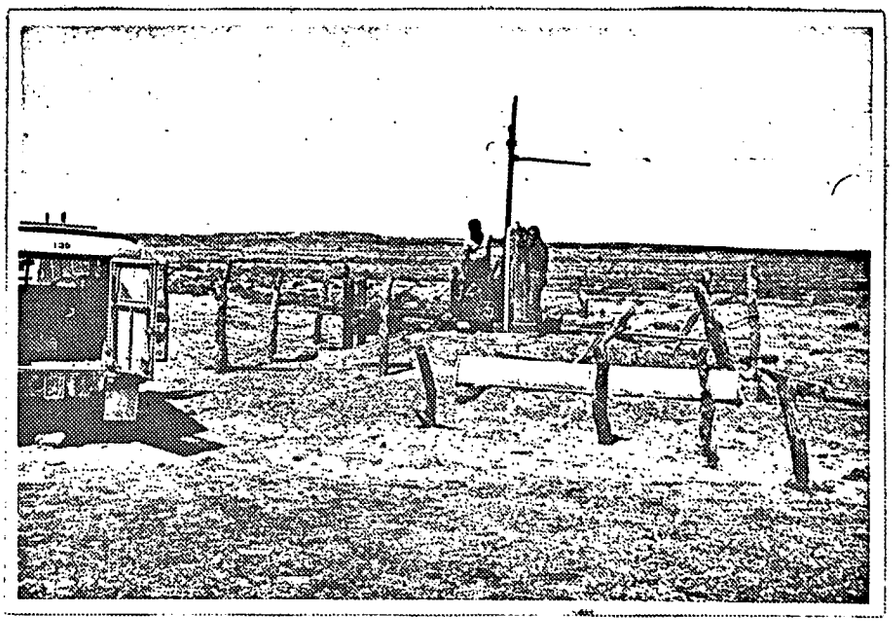
J/4 No. 9, Branson's Bore. Poor condition, very poor flow. (104,000,009)

15961



J/4 No. 2, Clayton Homestead Bore. Good condition and very good flow. Reconditioned by D.M. in 1966 (104000002)

15954



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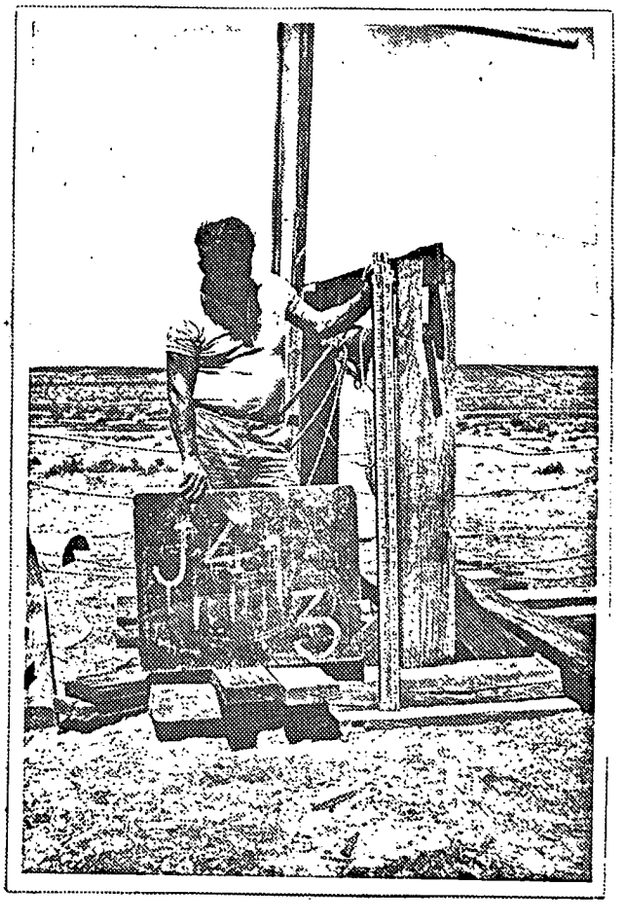
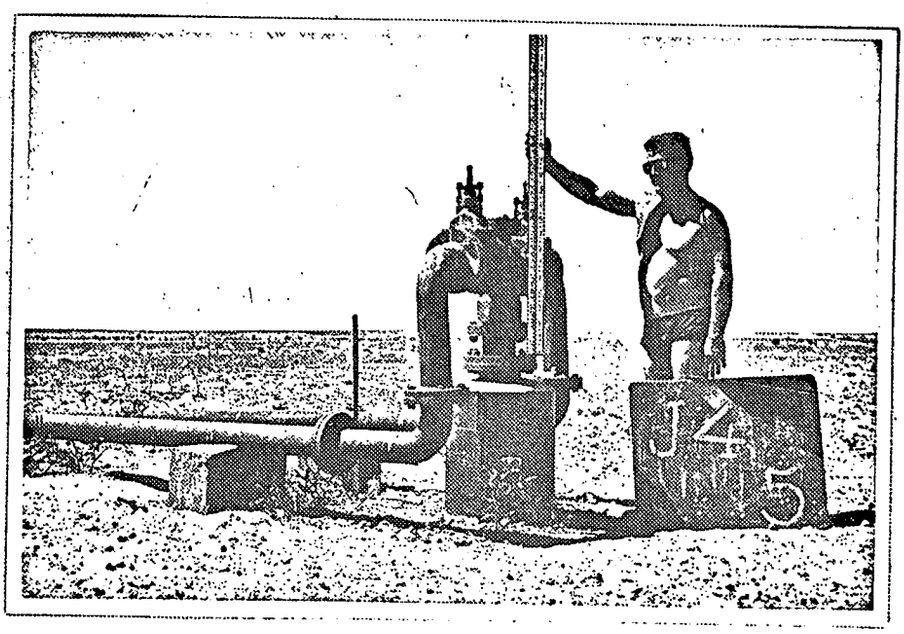


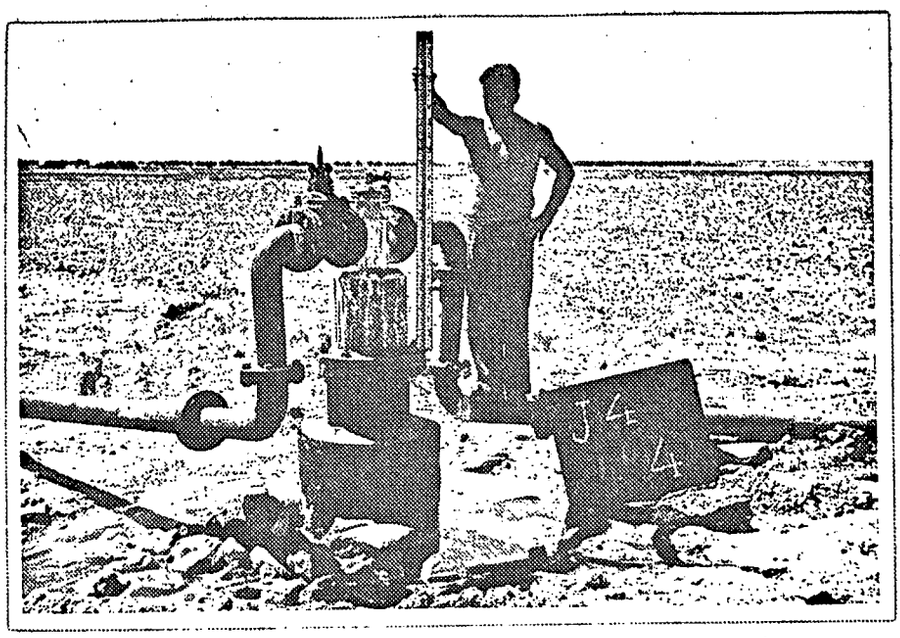
J/4 No. 3, (10400000) Tarpanina Bore and Well. Bore in bottom of well. Flow from bore but not from well. Well in poor condition

15960



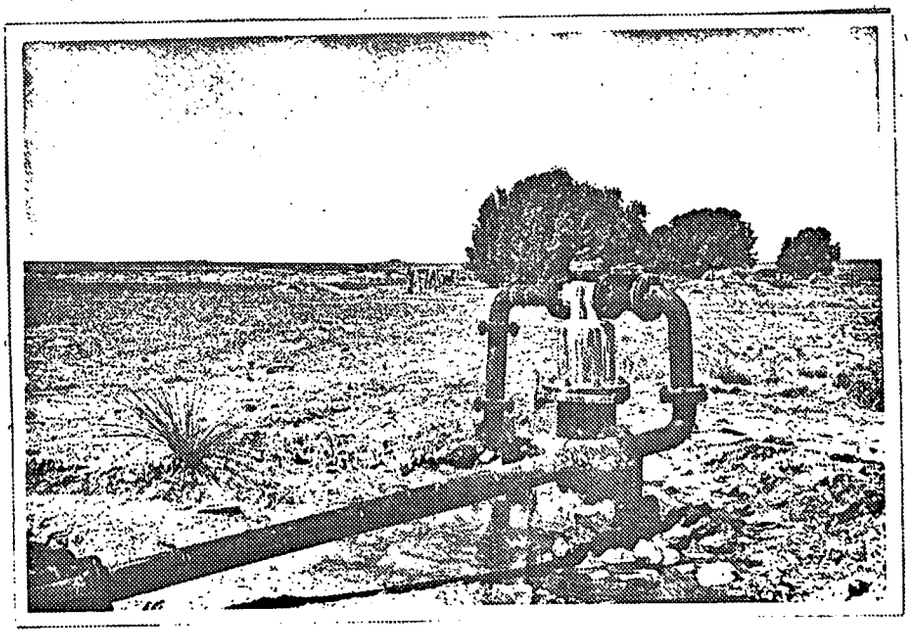
15982

J/4 No. 5, Sinclair Bore, good flow and good condition (104000005).



J/4 No. 4, Dulkanina Bore. Good flow, poor condition. To be fixed by D.M. in mid 19/67 (104000004)

15948



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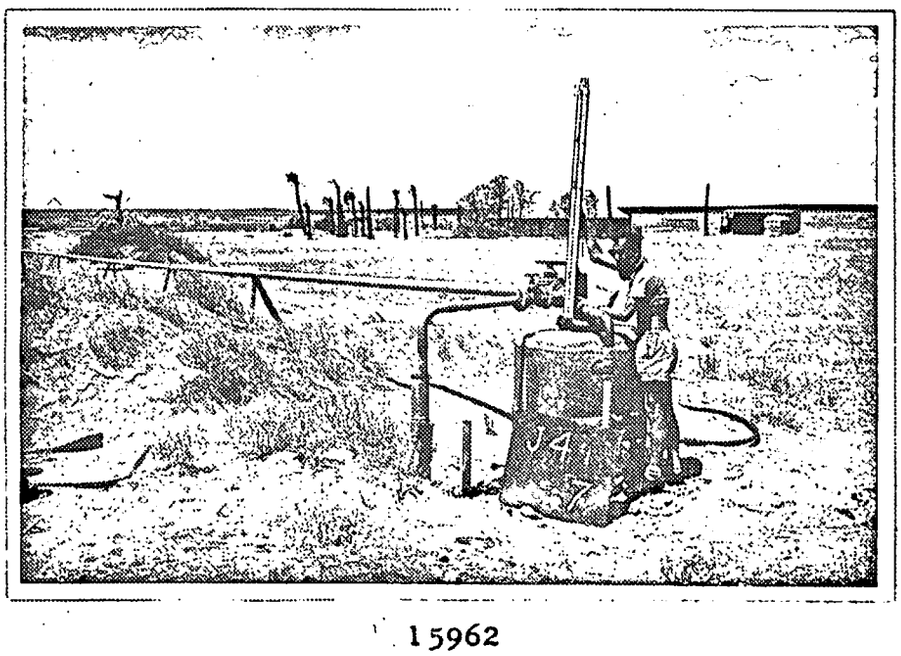
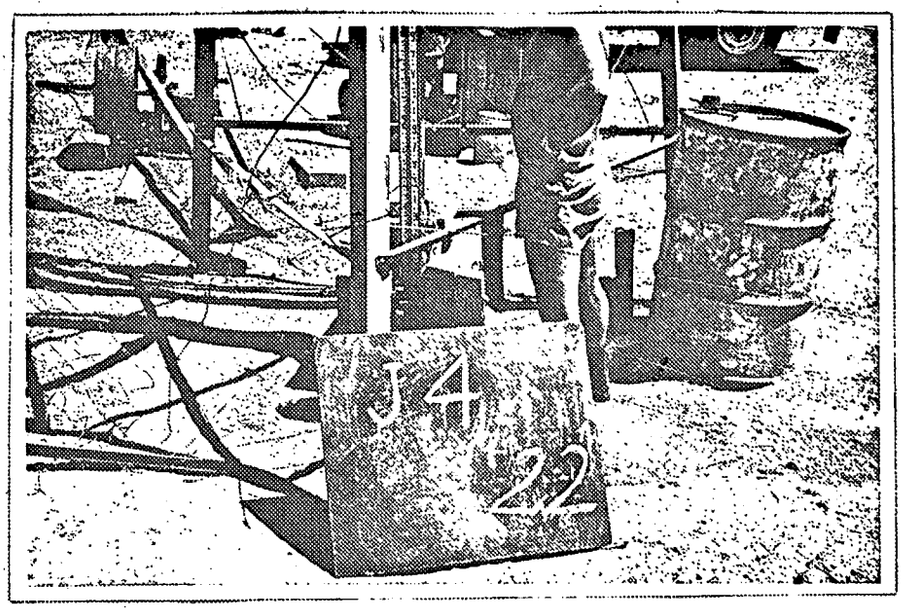


J/4 No. 7, Lake Harry Homestead Bore. Recently fixed by D.M. Good condition and flow (104000007)

15962



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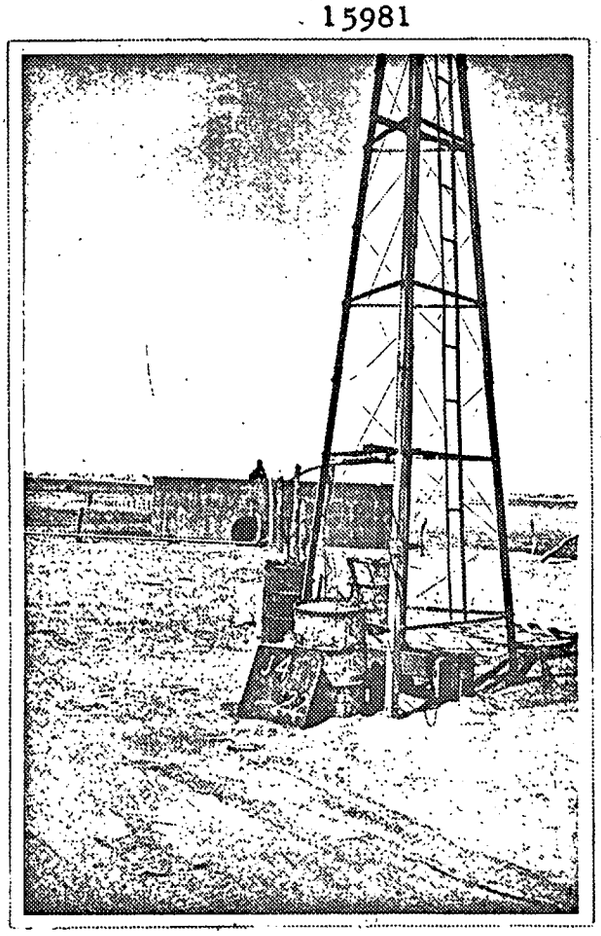
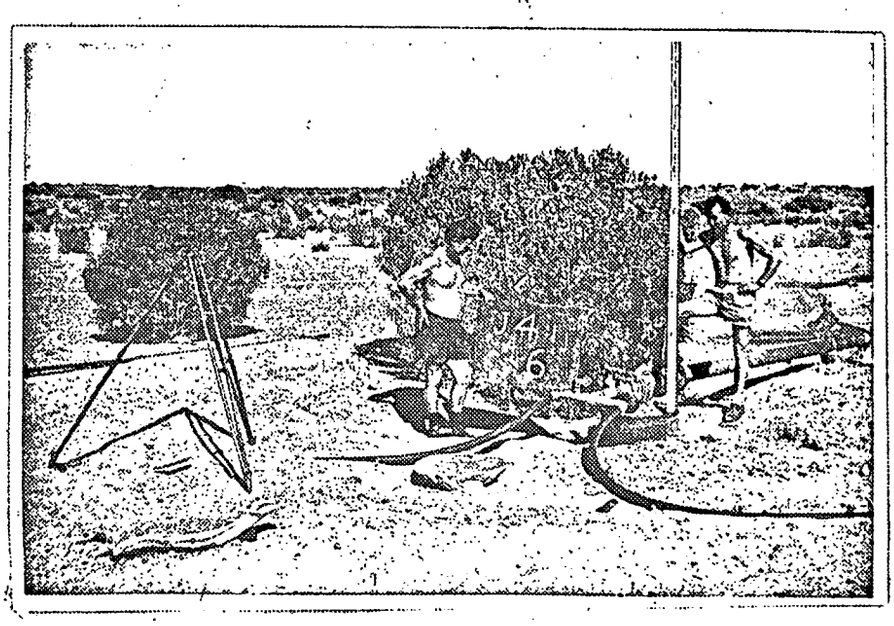


J/4 no. 22, Tent Hill Bore, not in G.A.A.B. Flowing Bores Project. N_o flow, fair condition (104000022)

15942

J/4 no. 6, Marion Bore, Good condition and good flow (104000006)



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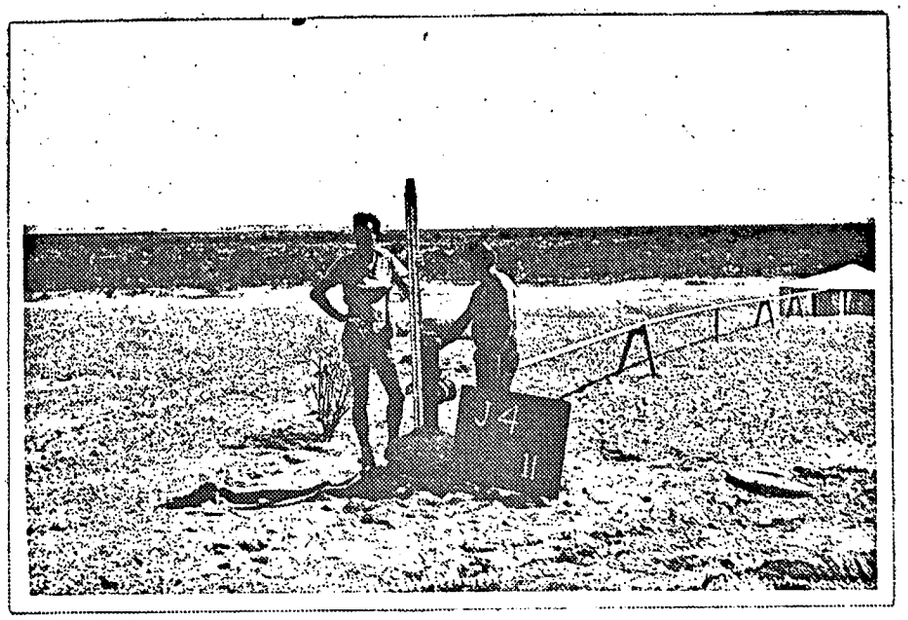
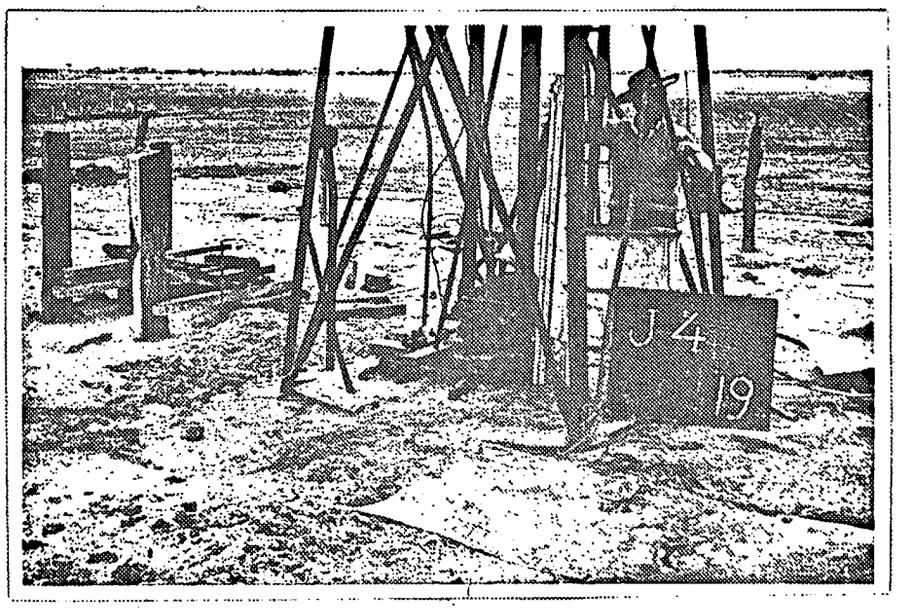


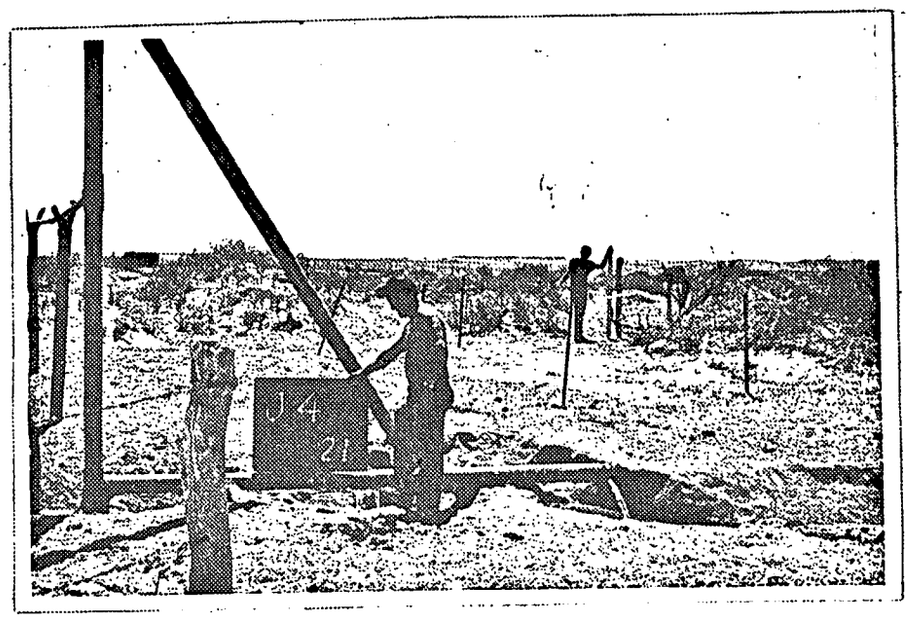
J/4 no. 11, Frome Ck. Bore Good condition fair flow. Has been drilled by D.M. (104000011)

15971



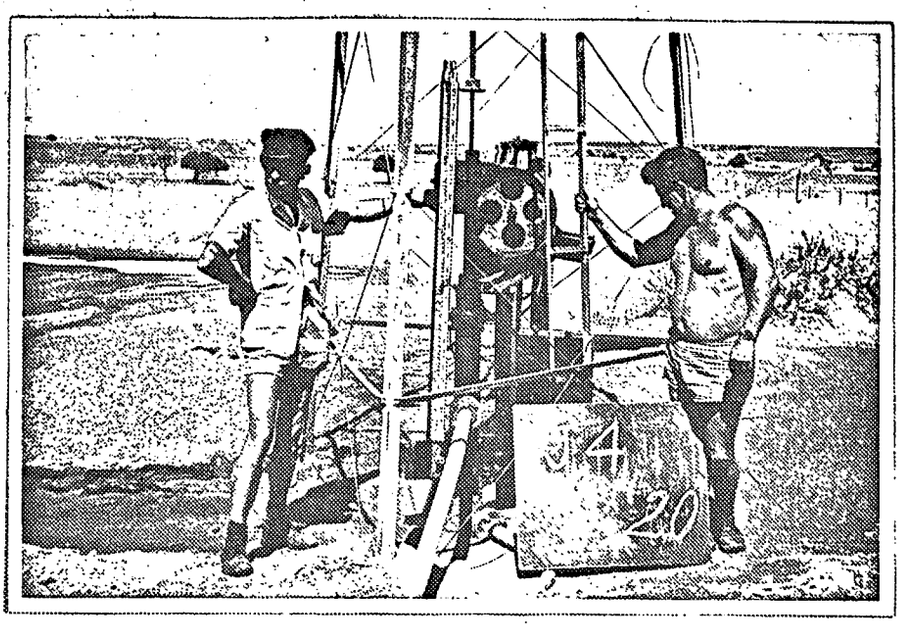
J/4 no. 19, Coolong Springs bore, fair condition, but no flow (104000019)

15965



J/4 no. 21, Lake Billy Bore. Poor condition and flow. To be fixed by D.M. in mid 1967 (104000021)

15973



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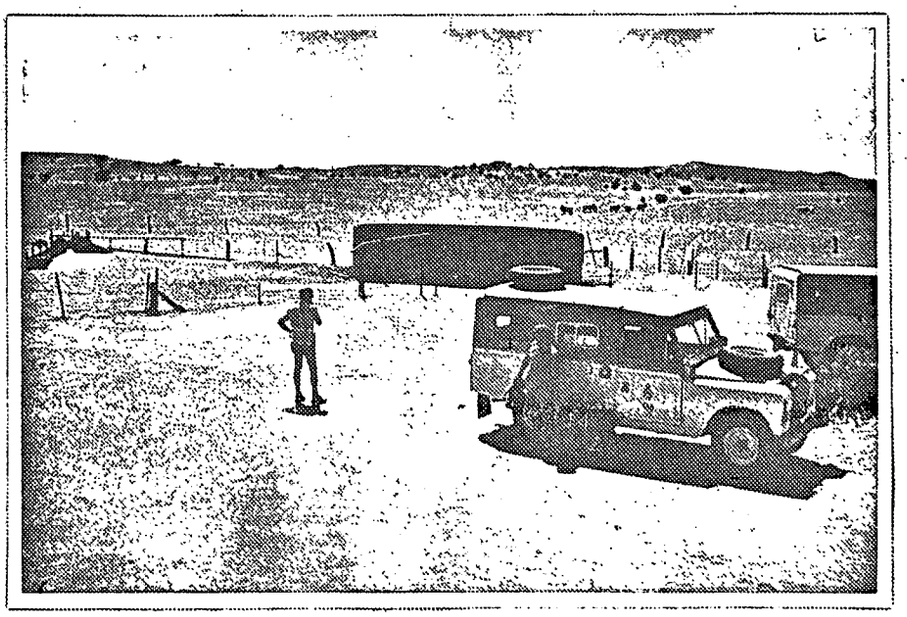
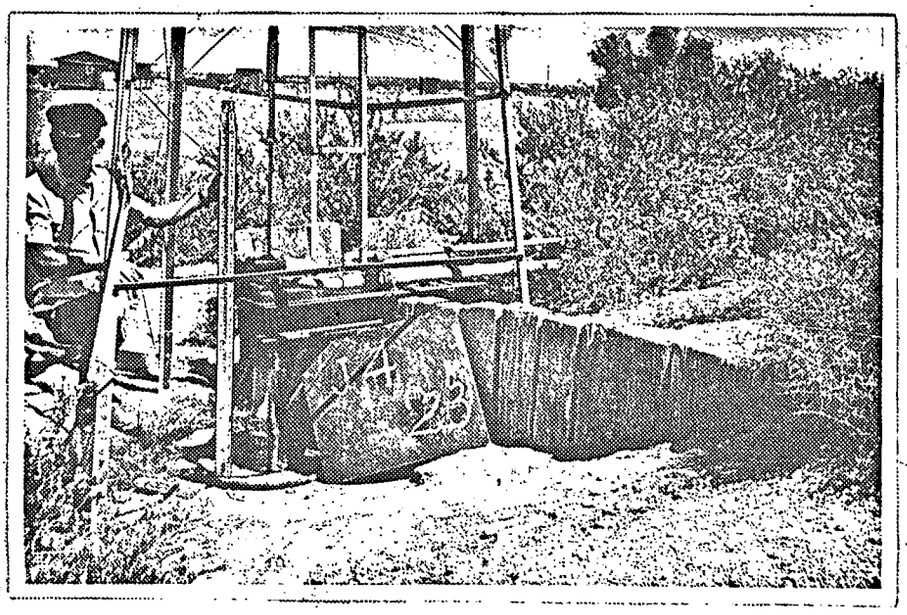


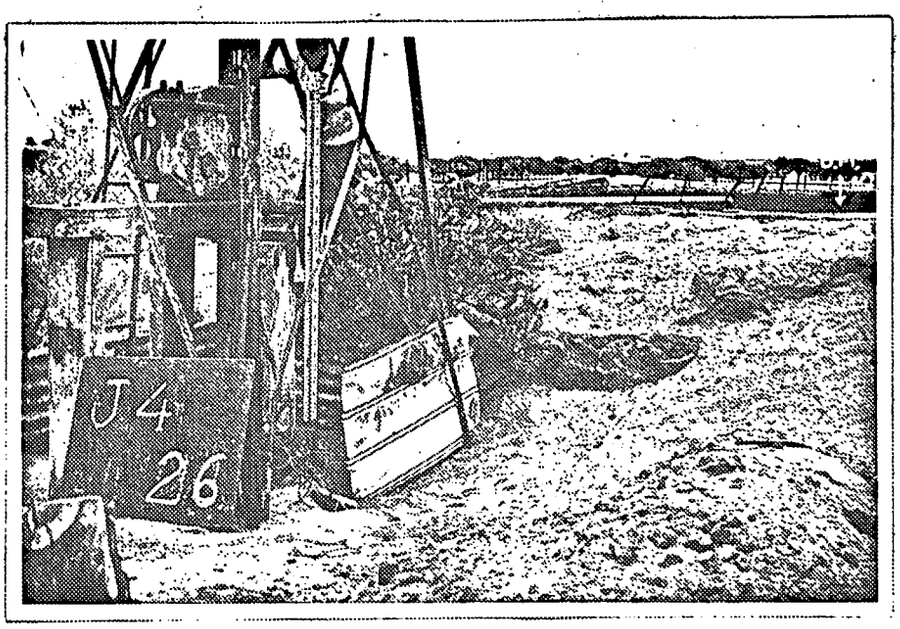
J/4 no 20, Well Ck. Bore. Good conditions poor flow (104000020)

15966



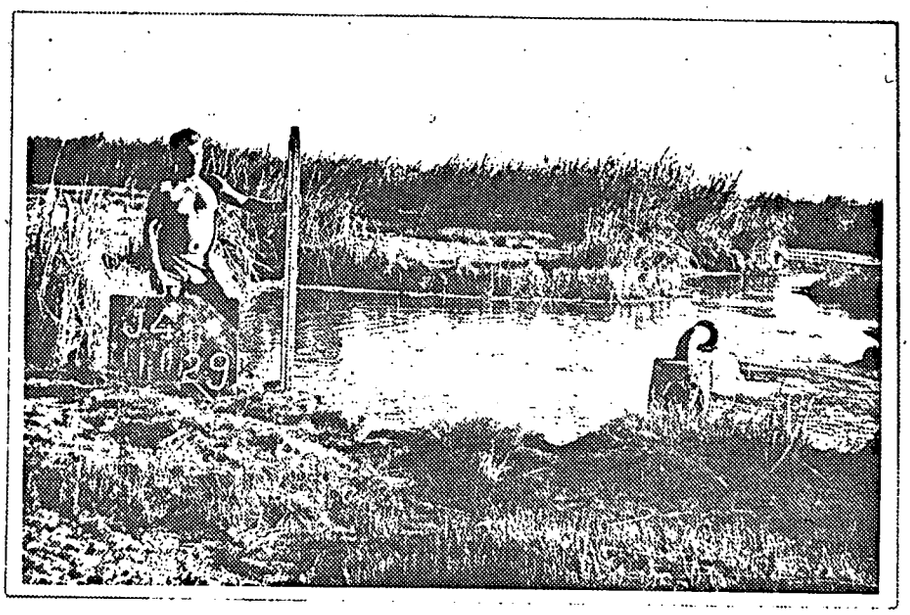
J/4 no. 23, Two Mile Bore. (or Woolshed Bore). Poor flow, fair condition. (104000023)

15977



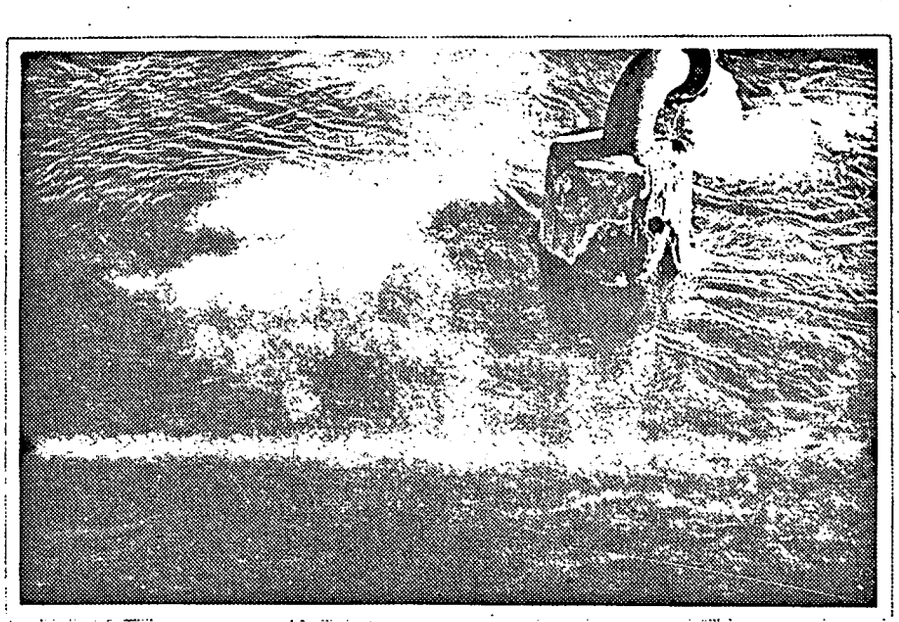
J/4 no. 26, Four Mile Bore Not in G.A.A.B. flowing Bores project. No flow, Poor condition. (104000026)

15963



J/4 no. 29, Cooryaninna Bore. Very poor condition. Water flowing through side of casing some depth down. Good flow (104000029)

15984



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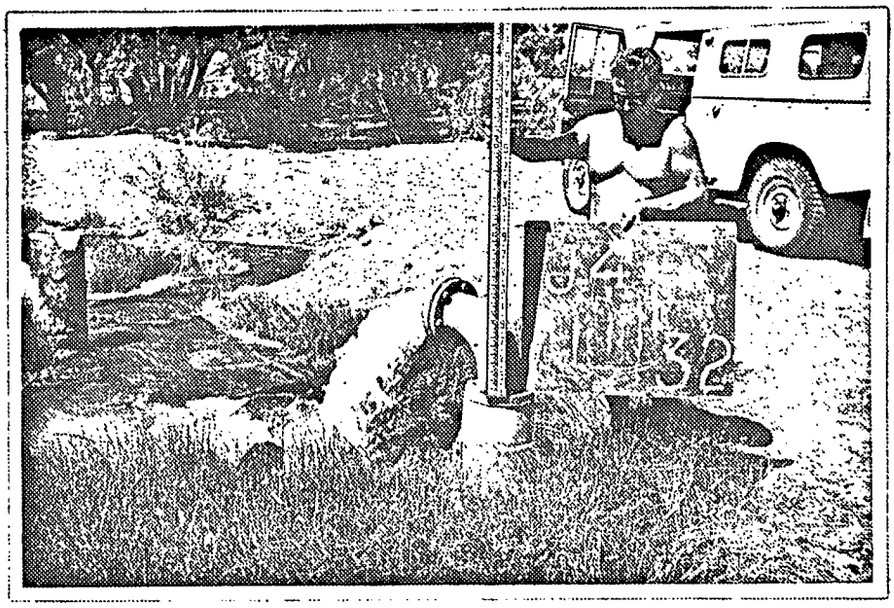
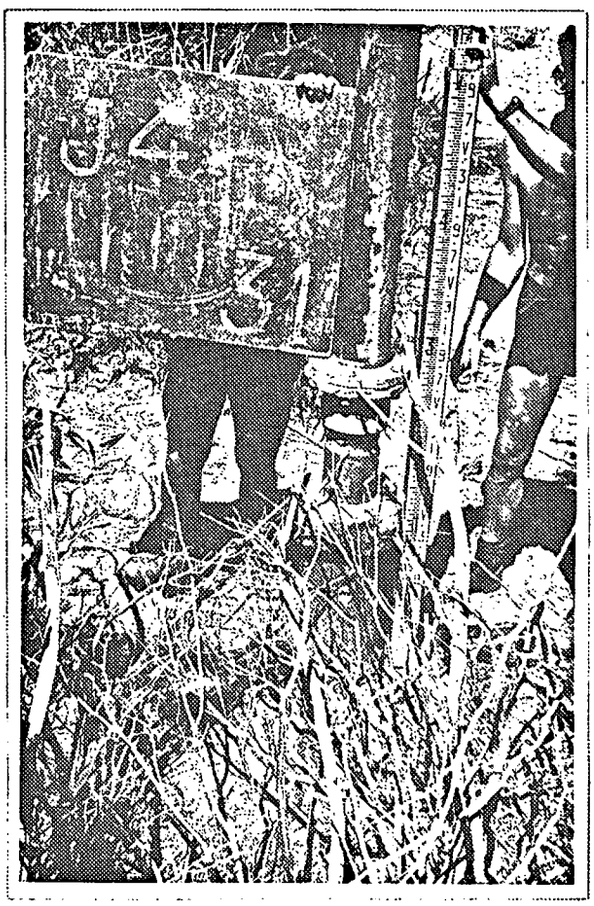


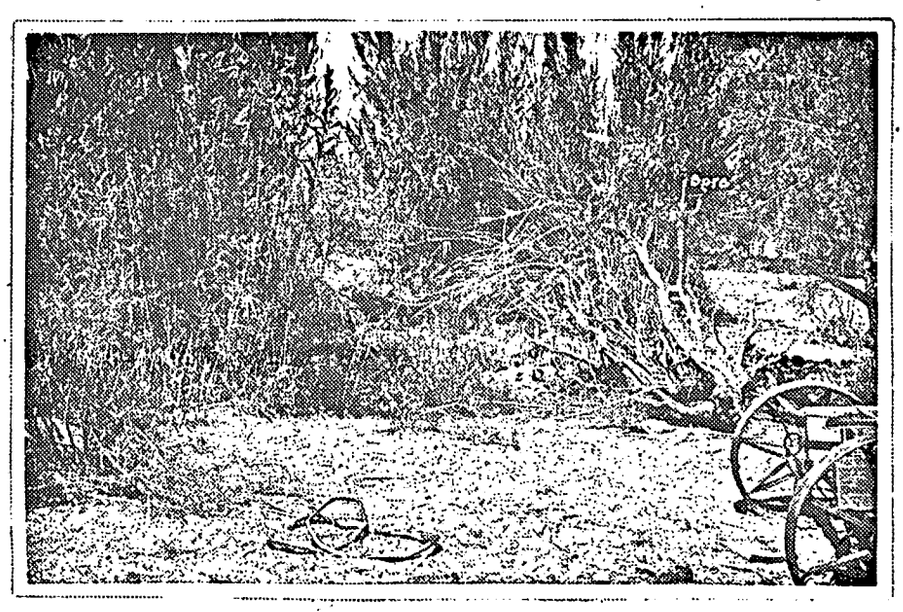
J/4 no. 32, New Troudininna Bore Good flow, good condition. (104000032)

15957



J/4 no. 31, Old Troudininna Bore. Poor flow, poor condition (104000031).

15931



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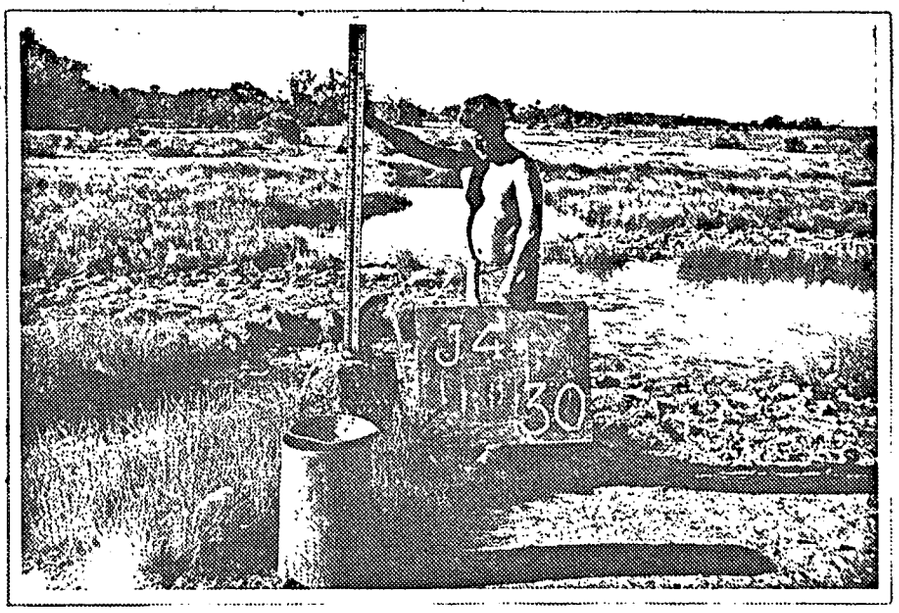
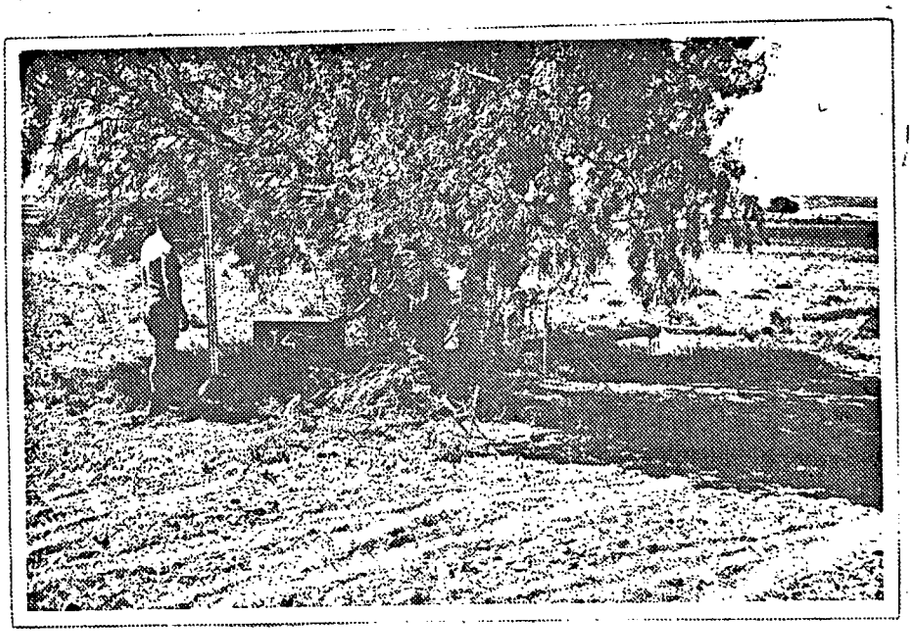


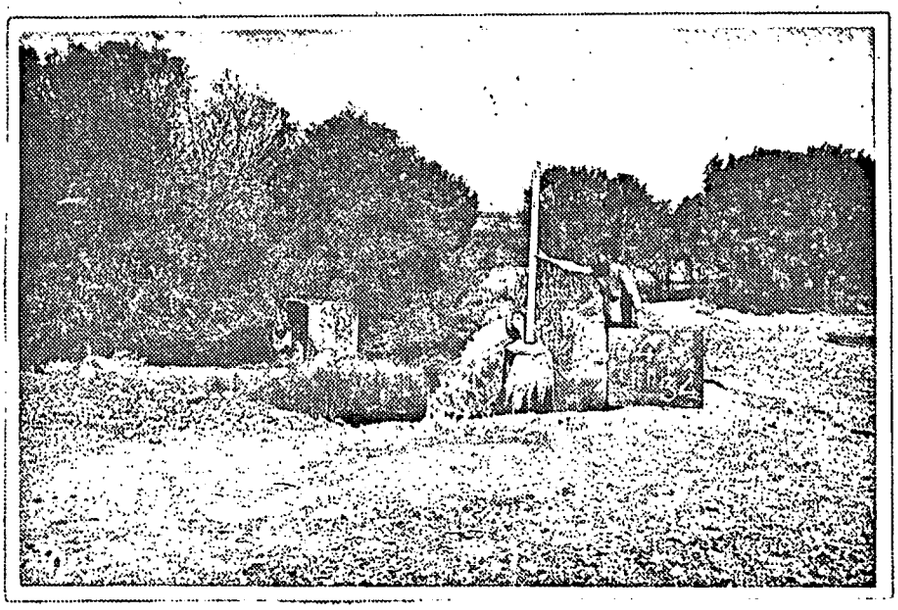
J/4 no. 30, Jewellery Bore. Poor flow, poor condition. Water leaking from casing and concrete (104000030)

15974



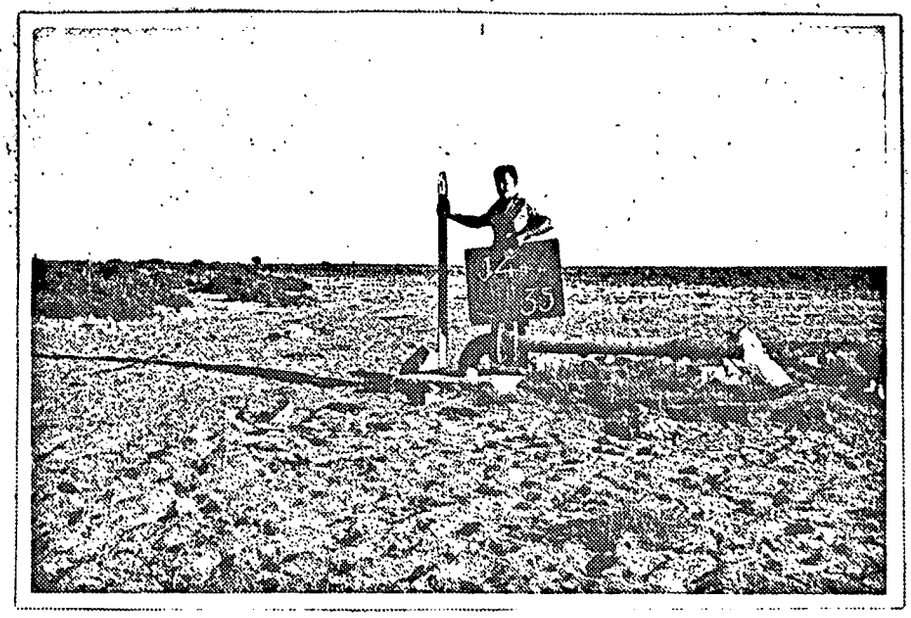
J/4 no. 33, Napalanna Bore. Good condition, good flow. (104000033)

15933



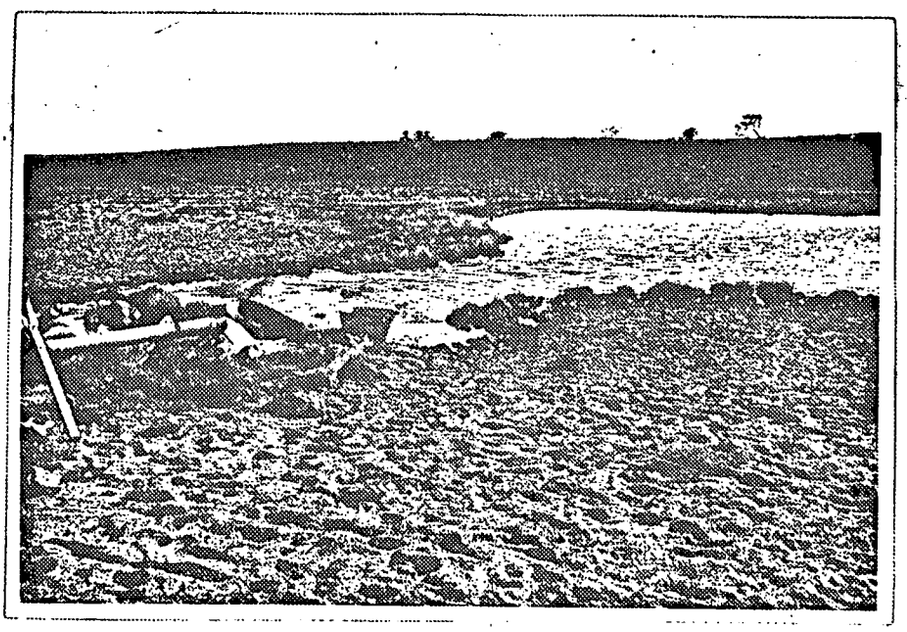
J/4 no. 34, Yarra Hill Bore. Poor condition, good warm flow. (104000034)

15968



15936

J/4 no. 35, Clayton Dam Bore. Good flow, fair condition, pipes starting to corrode (104000035)



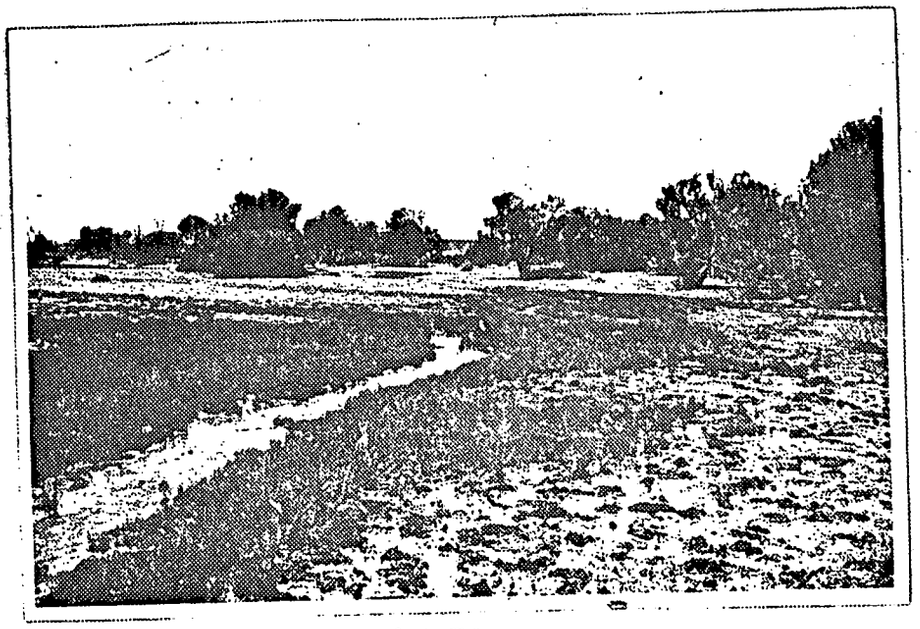
15935

15983

J/4 no. 75, Peter's Bore, good condition, fair flow. (104000075)

15969

J/4 no. 37, Nickotome Bore. Fair flow, poor condition. Leaking water from around concrete at ground level. (104000037)



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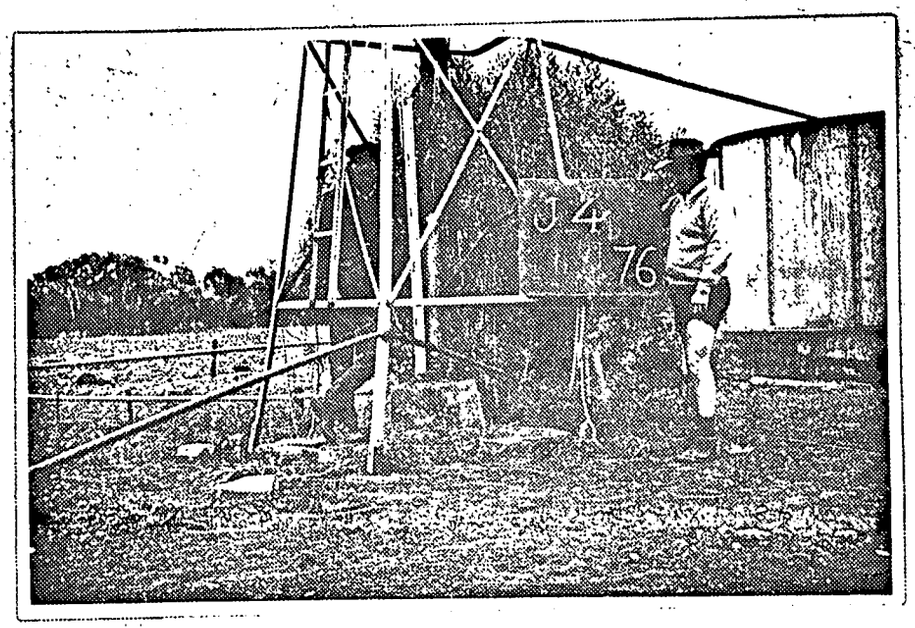
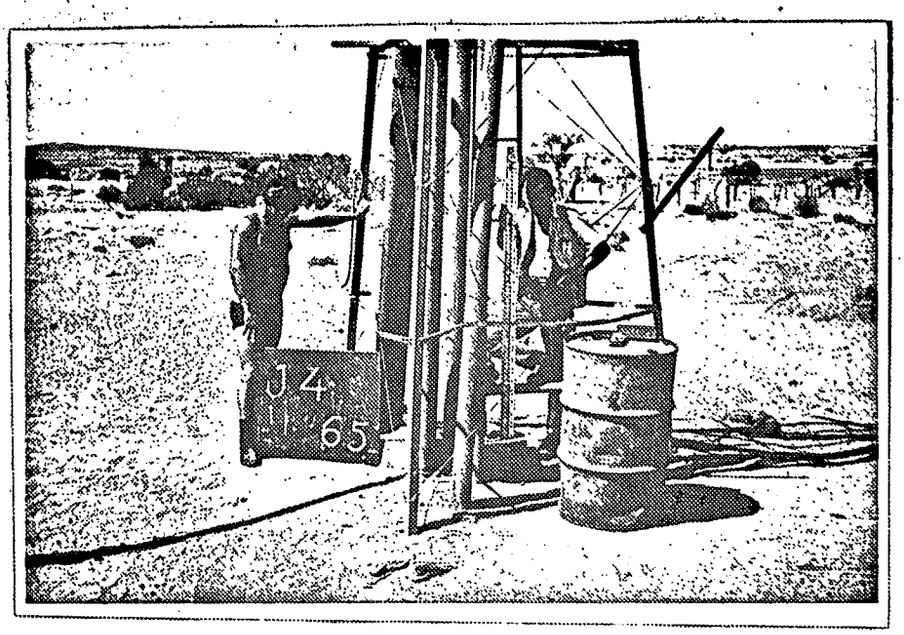


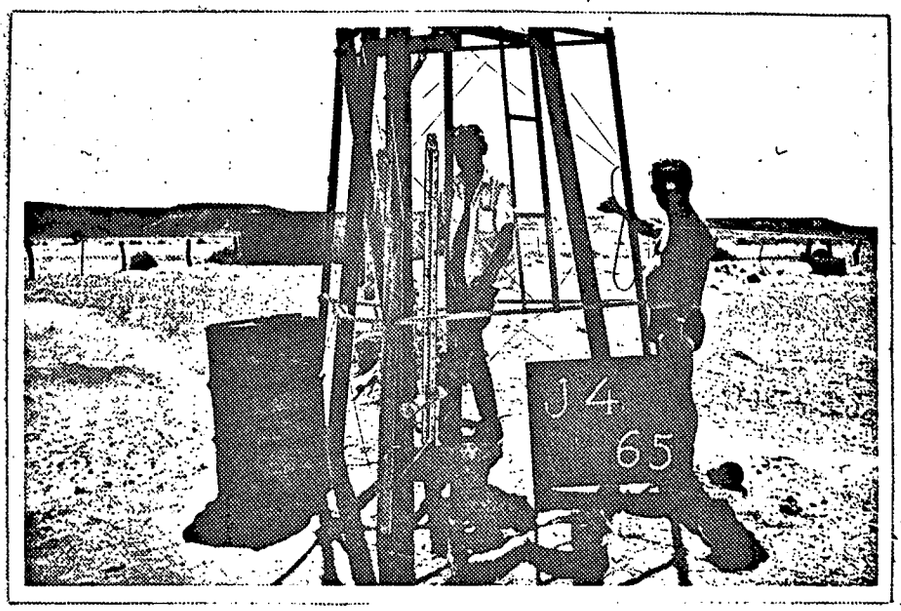
15978

J/4 no. 76, St. Stephens' Pond N^{O}. 2 bore No flow, fair condition (104000076)



J/4 no. 65, Clark Bore, bad condition, no flow. Believed to be blocked. (104000065)

15980



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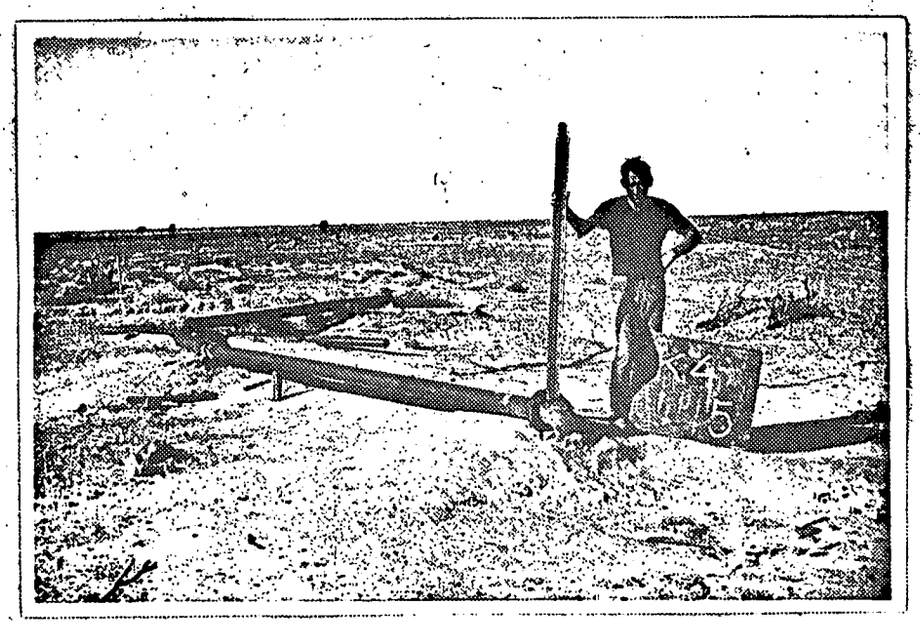
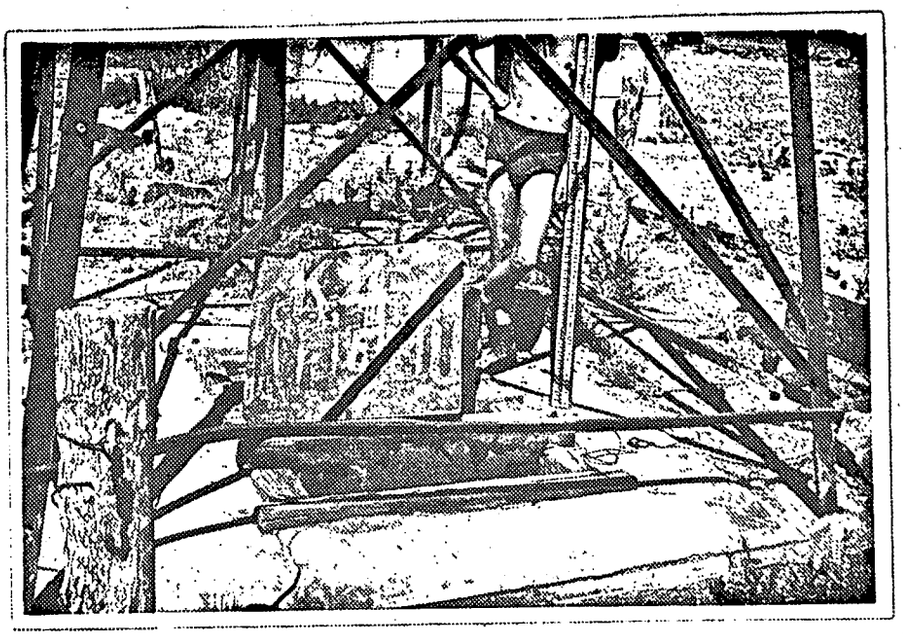


K/4 no. 5, Toonketchen Bore. Good flow, good condition (114000005)

15979

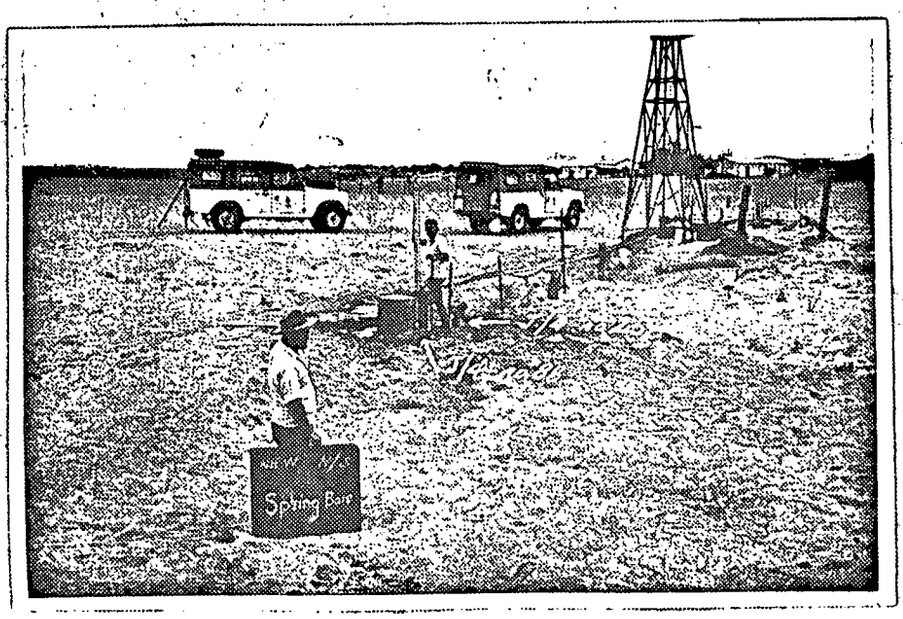


K/4 no. 6 Emu Well Not in G.A.A.B. project. Good condition. (114000006)

15937

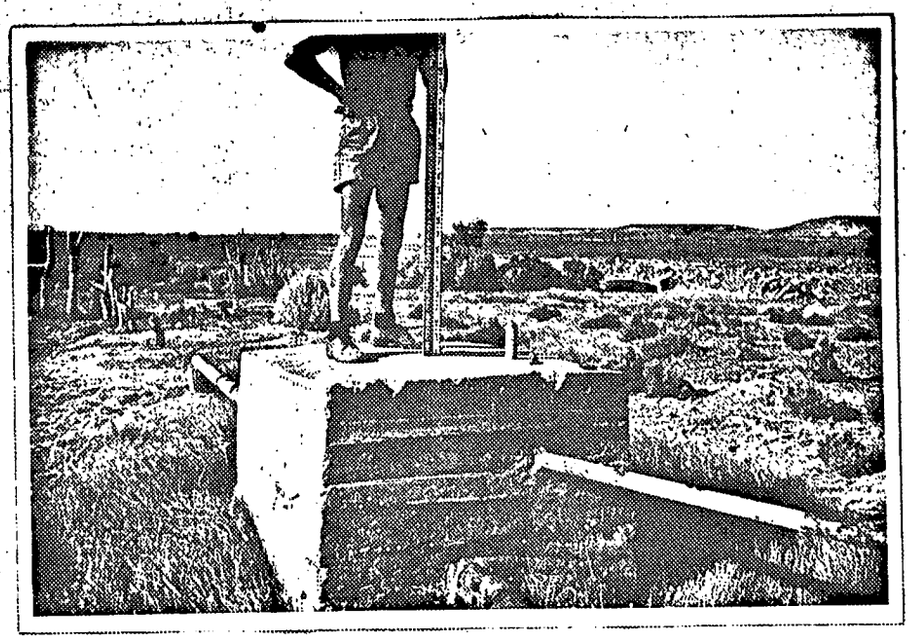
K/4 no. 7. Not in G.A.A.B. project. Fair condition. Junction Well. (114000007)

15938



J/4 no. 88, not in G.A.A.B. project. New Bore sunk in spring. Good condition. (104000088)

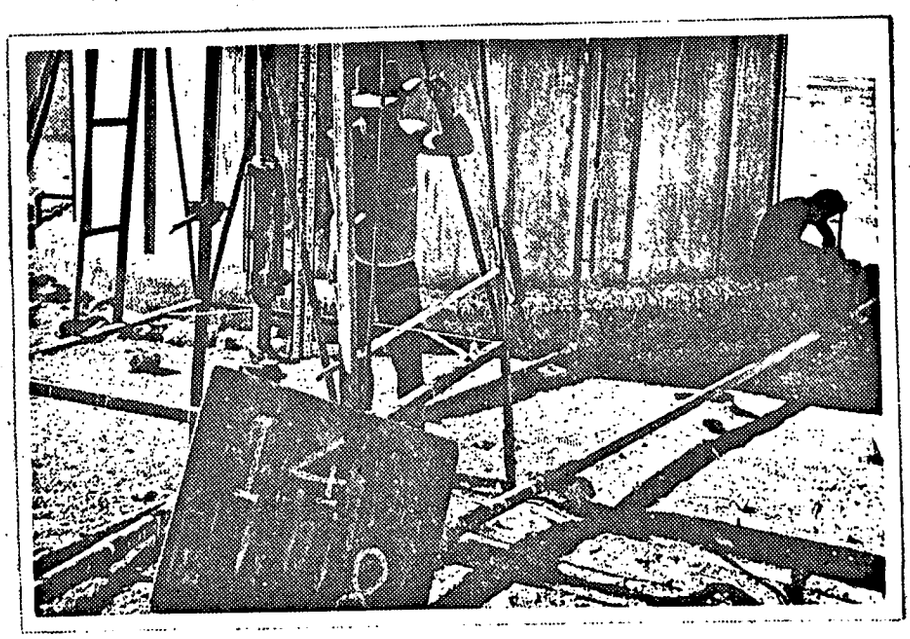
15943



K/4 no. 12, Murnpeowie H/S Bore. Good condition, good flow. (114000012)

15945

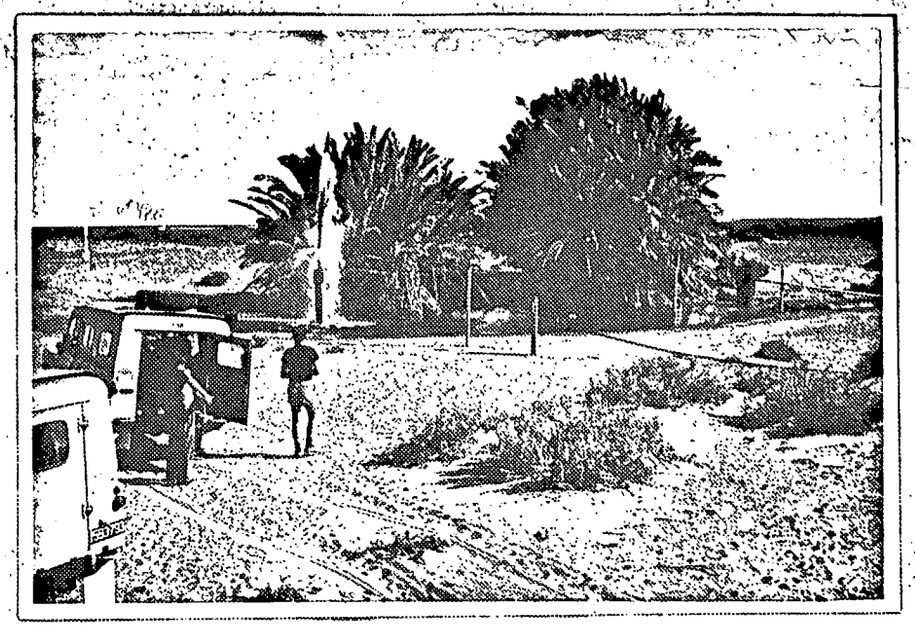
15944



I/4 no. 8,

Lake Lettie No. 1 bore. Good Condition, poor flow. (094000008)

15975



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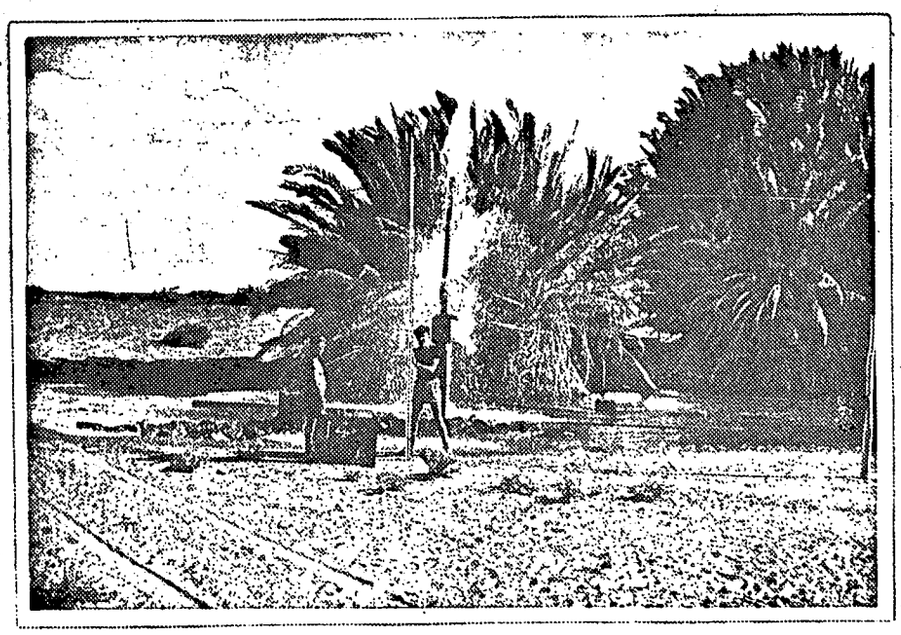
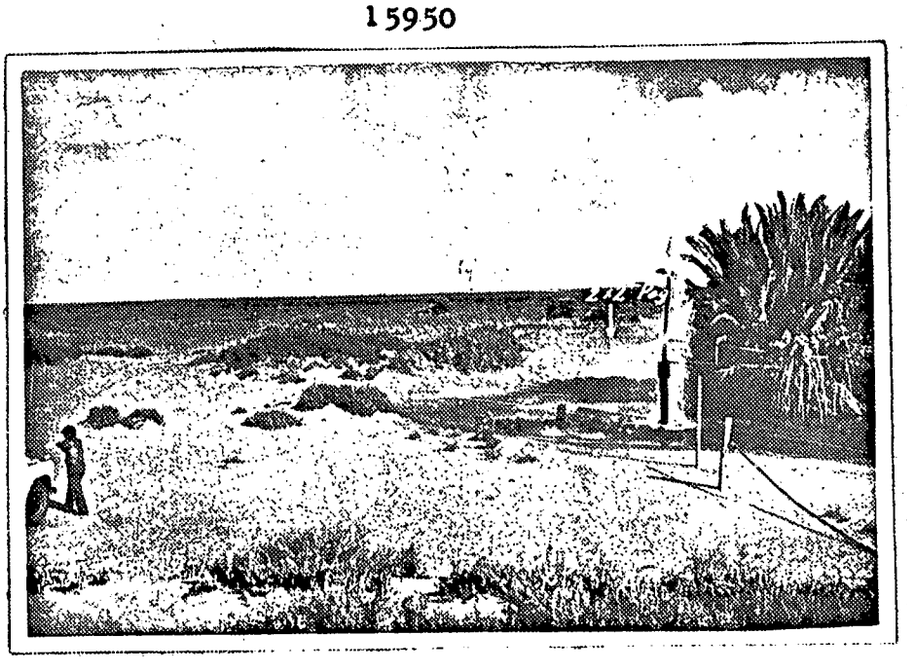


15950

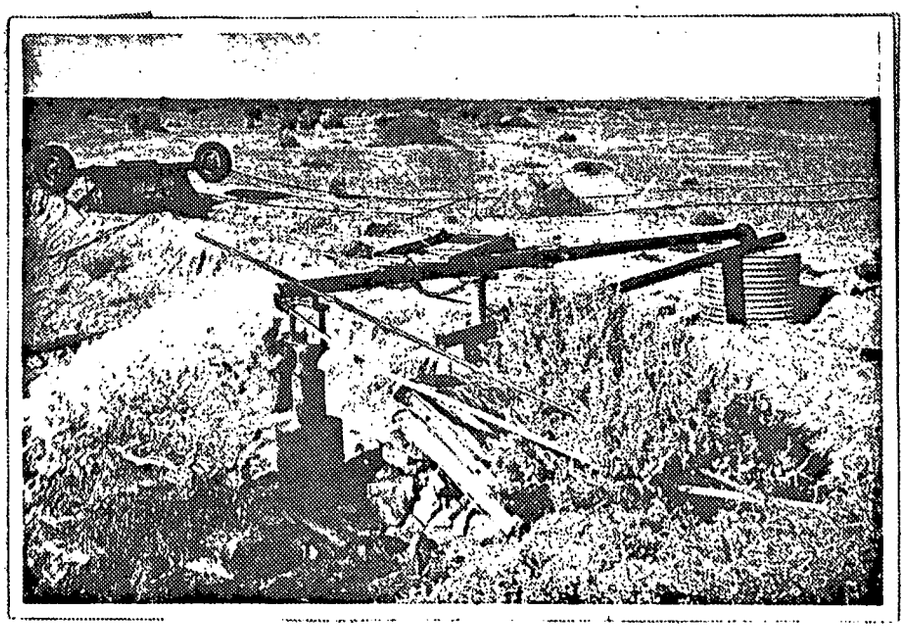
I/4 no. 6,
Lake Lettie No.2
bore (or Crows
Nest Bore).
Poor condition.
Very good flow
(1,000,000 g.p.d.)
(094000006)



15952

15956

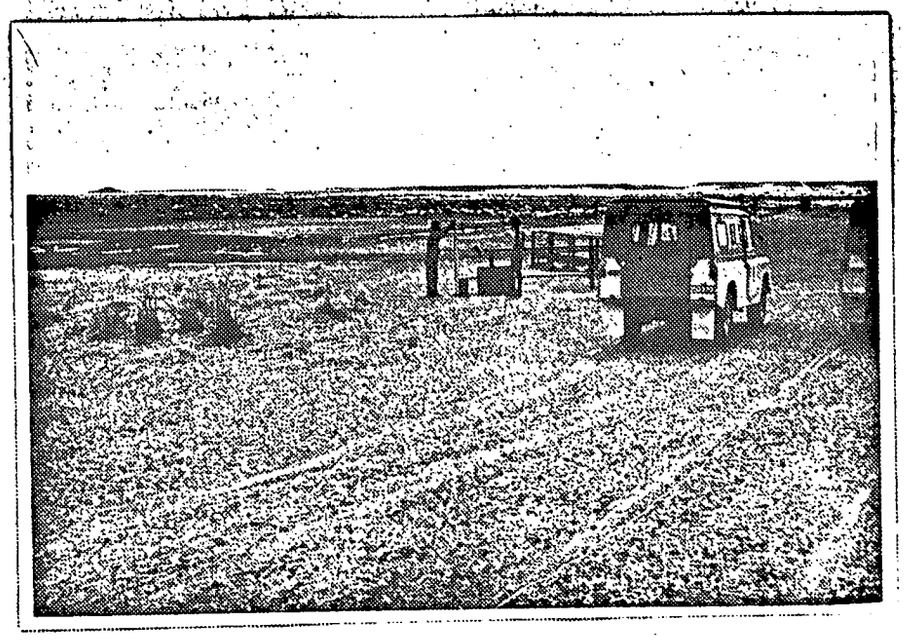
I/4 no.5,
Lake Lettie No.3
or Big Bore.
Good Flow,
good condition.
(094000005)



15955

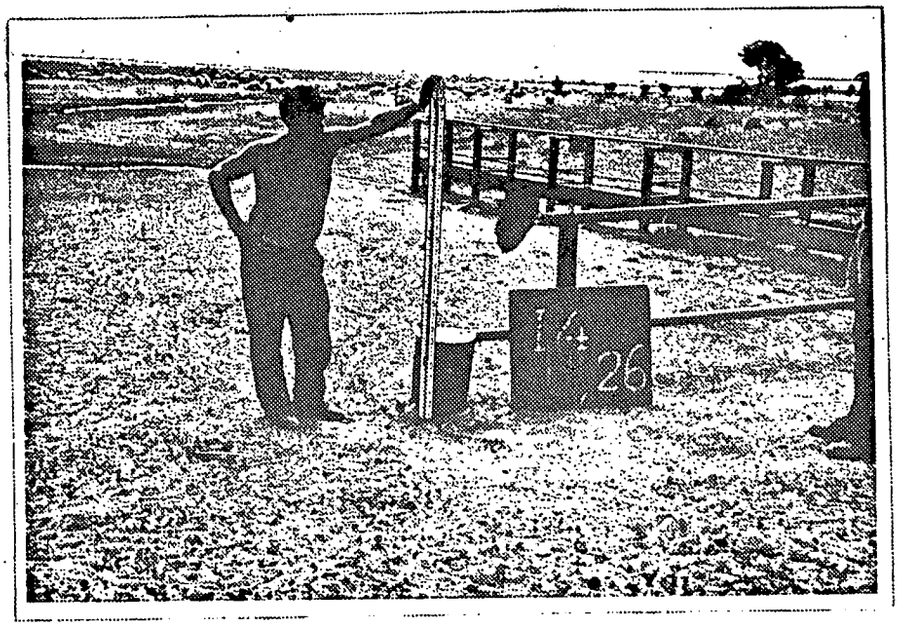
Camp site at
J/4 no. 32

15958



15953

I/4 no. 26
Callanna Bore
Good condition
Small flow
(cool water)
(094000026)



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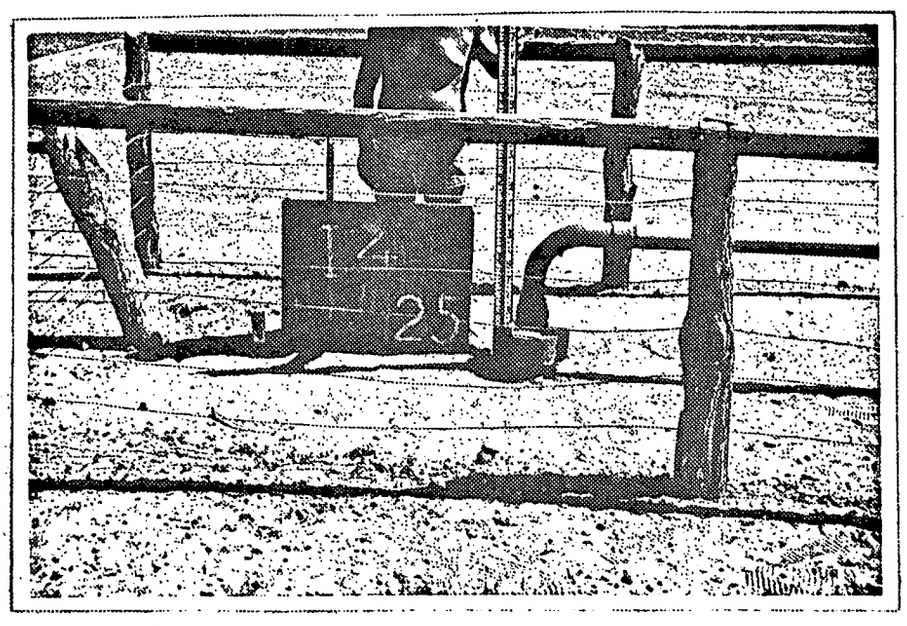
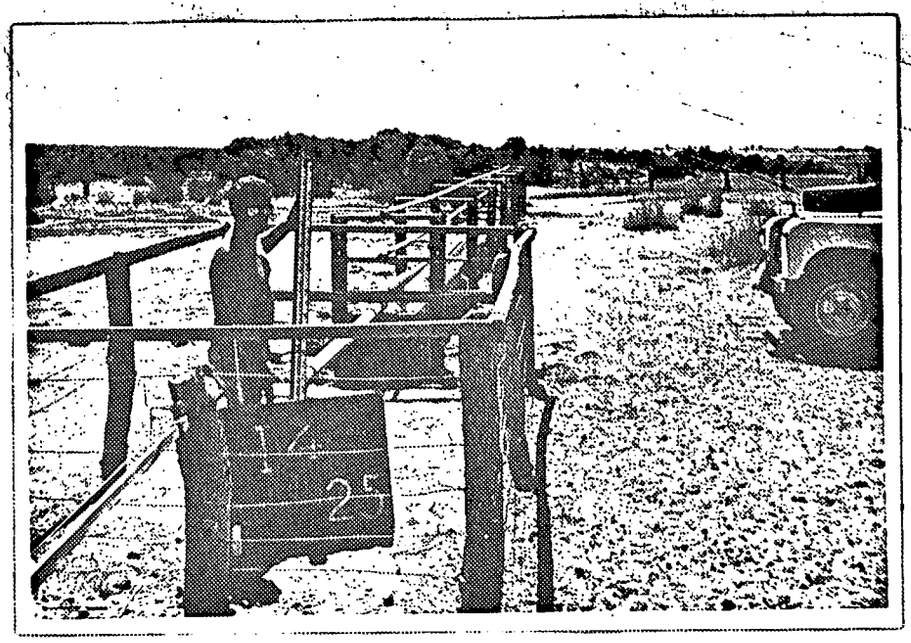


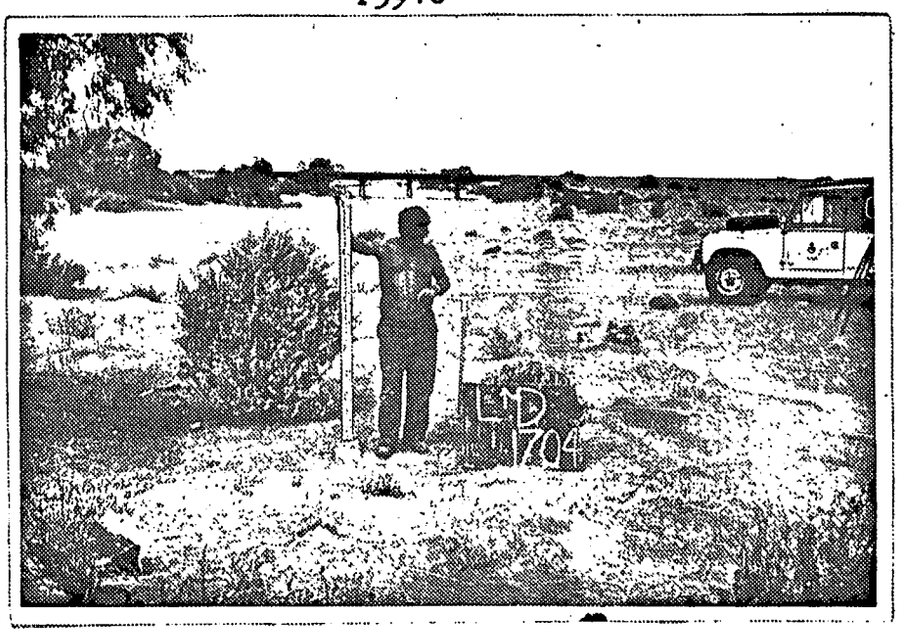
I/4 no. 25
Cooranna Bore
Good condition,
small flow
(cool water)
(094000025)

15947



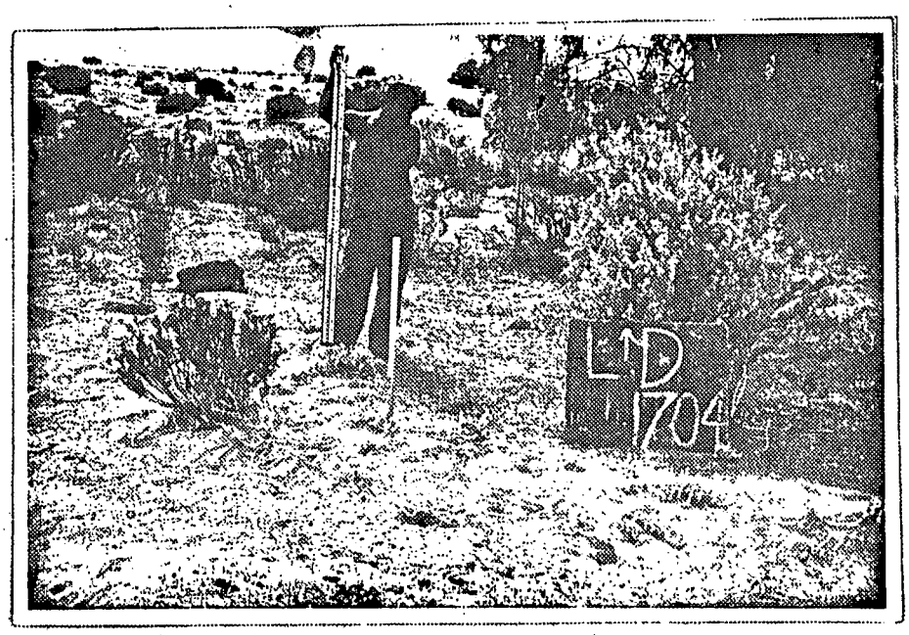
I/4 no. 25
Cooranna Bore
(094000025)

15946



Lands Dept,
3rd Order
level bench
Mark no. 1704
on Marree -
Oodnadatta Rd
by Callanna
Railway siding

15988



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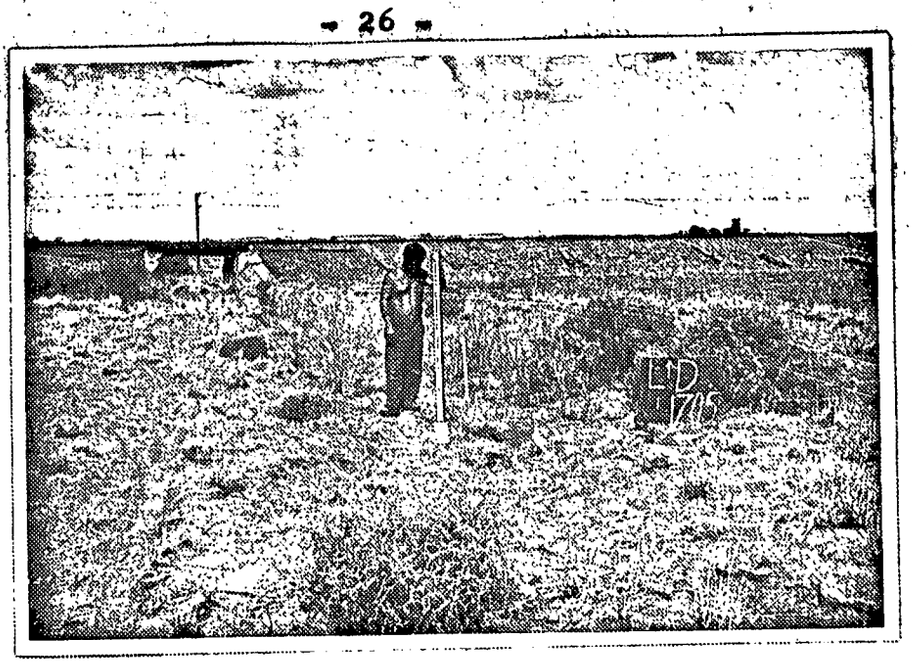
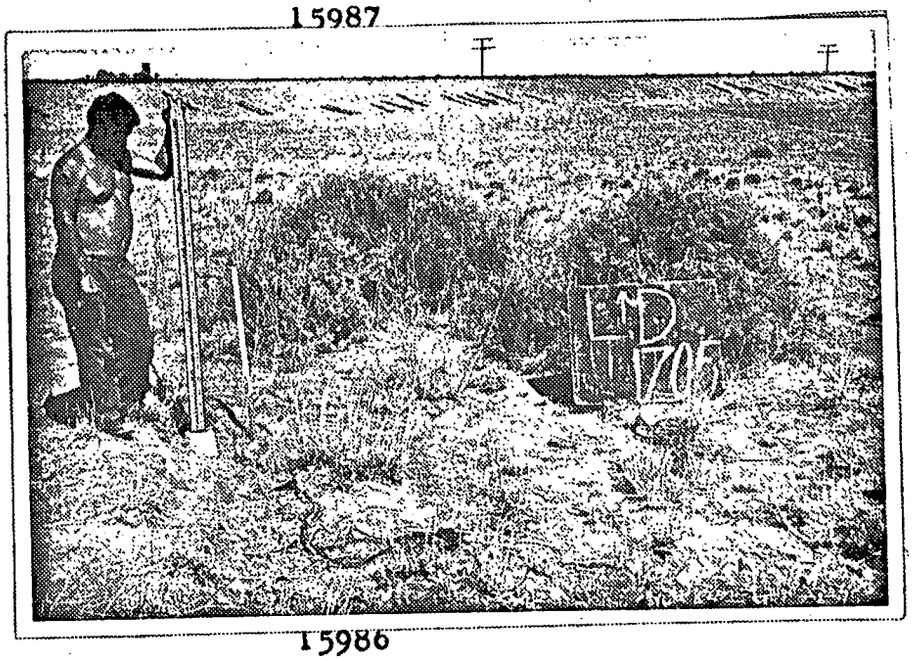


15987



15986

Lands Dept. 3rd order level Bench Mark 1705 2 miles north of Callana Railway siding on Marree - Oodnadatta Road,

Numbers below photographs refer to index file in records. Numbers in brackets refer to new method of indexing bores in South Australia

CONCLUSIONS

Special made foot-plates were used for holding the level staffs on in this survey. This produced better closure than when the staff was held on the natural surface especially in sandy country. For this reason, it is recommended that for the rest of the programme, these plates should be used without exception. Further to keep the backsight and foresight the same lengt 350 ft. lengths of firing line (or rope) should be dragged behind the vehicles to mark the position of instrument and staff points. This proved very successful and easy to operate in the present survey. Photographs of bore heads should be taken at each bore, not only to show the condition of the heads for geologists and engineers but also to show where the staff reading was taken.

Attached in the end of this report is the proposed schedule for the second trip to be undertaken by J. Erkelens on the first of May this year.

CF:CE:CC:OB

C. FRYTERS
SURVEYOR
DRAFTING SECTION

Note:
A further adjustment was carried out for loop six (page 5) on completion of second field trip. For details see Progress Report number two by J. Erkelens.

2ND SURVEY G.A.A.B.

FLOWING BORES

Party in charge of J. Erkelens, due to leave Adelaide 1.5.1967.

The following is an approximate programme of work.

1. BM1712 to I/4 No.23 to Charles Angus Bore I/4 No.18, to Morris Creek Bore I/4 No.17, to Crows Nest Bore I/4 No.6 (2" x 2" BM at Crows Nest Bore) (Distance 28 miles)

2. BM1712 to I/4 No.44 to BM1710 (6 Miles)

3. BM1712 to I/4 No.19 to BM1716 (11¼ miles)

4. BM1717 to I/4 No.15 and back (9 miles)

5. BM1716 to I/4 Nos. 46, 21, No.24, No.13, No.48 and BM1720 if possible otherwise to H/s then BM1723 (36 or 42 miles)

6. BM1723 to I/4 No. 9 and back (14 miles)

7. BM1728 to H/4, No.17 and back (½ mile)

8. BM3126 to H/4, No.14 and back (1 mile)

9. BM3129 to H/4, No.11 and back (1 mile)

10. BM3130 to H/4, No.12 and back (1 mile)

11. BM3131 to H/4, No.13 and back (2½ miles)

12. BM3134 to H/4, No.19 and back (1¼ miles)

13. BM3131 (or 3132) to H/4, No.6, then No.60, back to No.6 and onto No.4 (29 miles)

14. BM1732 to H/4, No.10 and back (4½ miles)

15. BM1733 to H/4, No.8 and back (1 mile)

16. BM1738 to H/4, No.59 and back (½ mile)

17. BM1736 to H/4, No.4 and back (½ mile)

18. BM1741 to H/3, No.53 and back (4 miles)

19. BM1743 (or 1744) to H/4, No.56 and back (18 miles)

20. BM1743 (or 1744) to H/3, No.58, No.54, No.60, No.36, No.29 No.24, No.4, No.52, G/3 No.11 and BM1770 (Suggest to 54 then 58 and back to 54) (107 miles)

21. If possible to H/3, No.21 and back, from H/3, No.24 using altimeter.

(46 miles)

22. BM1766 to G/3, Nos. 22,23, 20, 17, 15; BM1767

(38 miles)

Check with Anna Creek Station for easiest and shortest route to G/3 No.36 and G/3, No.1

Loops should close to one foot in 60 miles or 0.10 in one mile, using 0.10 M where M is in miles. Keeping B.S. and F.S. the same length and less than 370 feet should achieve these results.

GREAT AUSTRALIAN ARTESIAN BASIN

FLOWING BORES

L.B. 389 and 390 — M.S.L. = 0 Pt. Adelaide

Grid	Bore No.	Bore Name	Bore Level	B.M. Level	Remarks
I/4	5	Lake Lettie No. 3	55.83	78.25	L.B. 390 page 29
"	6	Lake Lettie No. 2	51.68 (G/L)	55.79	L.B. 390 page 32
"	7	Morris	Bore Buried in.	-	
"	8	Lake Lettie No. 1	111.19	110.39	L.B. 390 page 26
"	25	Cooranna	69.16	69.16	L.B. 390 page 35
"	26	Callanna	143.89	144.29	L.B. 390 page 39
J/4	2	Clayton	148.30	140.51	L.B. 390 page 12
"	3	Tarkanina	173.49 (Well)	147.97	L.B. 390 page 14
"	4	Dulkaninna	125.08	123.36	L.B. 390 page 21
"	5	Sinclair	223.24	221.21	L.B. 390 page 17
"	6	Marion	201.36	201.42	L.B. 389 page 7
"	7	Lake Harry	146.74	138.59	L.B. 389 page 10
"	9	Branson	109.91	109.35	L.B. 389 page 5
"	11	Frome Ck.	146.38	126.54	L.B. 389 page 10
"	12	Hergott Spr.	124.39	124.34	L.B. 389 page 3
"	15	Marree Railway	151.27	150.53	L.B. 389 page 2
"	16	Abdul	154.51	153.20	L.B. 389 page 2
"	17	Marree No. 1	148.43	147.29	L.B. 389 page 2
"	19	Coolong Springs	141.96	142.37	L.B. 389 page 17
"	20	Well Creek	232.71	231.48	L.B. 389 page 13
"	21	Lake Billy	221.51 (G/L)	222.15	L.B. 389 page 25
"	23	Two Mile	226.88	226.97	L.B. 389 page 15
"	29	Cooryaninna	103.02 (G/L)	102.62	L.B. 389 page 45
"	30	Jewellery	75.35	73.49	L.B. 389 page 52
"	31	Old Troudininna	149.16	-	L.B. 389 page 49
"	32	New Troudininna	150.25	-	" " " "
"	33	Chapalanna	196.79	196.33	L.B. 389 page 38
"	34	Yarra Hill	208.76	207.32	L.B. 389 page 35
"	35	Clayton Dam	244.59	244.84	L.B. 389 page 26
"	37	Nickotime	272.97	270.41	L.B. 389 page 41
"	65	Clark	264.12	263.67	L.B. 389 page 23

L.B. 389 and 390 M.S.L. = 0 Pt. Adelaide

Grid	Bore No.	Bore Name	Bore Level	B.M. Level	Remarks
J/4	75	Peters	83.87	81.39	L.B.390 page 24
"	76	St. Stephens Ponds No. 2	138.31	136.95	L.B.389 page 17 ~~log~~
K/4	5	Toonketchem	162.39	161.52	L.B. 390 page 4
"	12	Murnpeowie	272.39	273.71	L.B. 390 page 11

GREAT AUSTRALIAN ARTESIAN BASIN

NON FLOWING BORES

L.B. 389, 390 — M.S.L. = 0 Pt. Adelaide

Grid	Bore No.	Bore Name	Bore Level	B.M. Level	Remarks
J/4	-	Old Hergott Spring	124.34	124.39	L.B.389 page 3
J/4	25	Mundowdna H/S	206.43	209.39	L.B.389 page 15
J/4	88	"	208.30	209.39	" " " "
J/4	26	Four Mile	193.81	196.92	L.B.389 page 18
J/4	22	Tent Hill	243.12	242.61	L.B.389 page 21
K/4	6	Emu Well	121.72	-	L.B.390 page 6
K/4	7	Junction Well	178.70	-	L.B.390 page 8
K/4	11	Central Well	224	-	L.B.390 page 9

F
135°
G
136°
H
137°
I
138°
J
139°
K
140°
L
141°
RITORY
QUEENSLAND
26°
27°
28°
29°
30°
31°
1
2
3
4
5
ALLINGA
PURNIE NO 1 (OIL)
WITCHERIE NO 1 (OIL)
JUNCTION
MEMORY CREEK
APPIRINNA
STEVENSON
MOUNT SARAH
HORSE SHOE
MACUMBA
SNAKE CREEK
ALBERGA
WIRE CREEK
BROWNS CREEK
OODNADATTA
DUCK HOLE
STATION HOMESTEAD
WATSON CREEK
PLECHARMURRANA
WONDILLINA
Mt DUTTON
CADNAOWIE
OCHENDEN
(OIL) TOONDINA NO. 1
(OIL) TOONDINA NO. 2
COOTABARCOOLLIA
WOODDUCK
WILD DOG CREEK
PEAKE
RASPBERRY CREEK
5 MILE BORE
BLYTHE
ONE TREE
7 MILE BORE
NILPINNA STN GARDEN & SPRING
MILNE
EDWARDS CREEK
JOHNSON NO.3
LEVI
SPRINGS
EMBUM
HOPE CREEK
WILLOW
SUNNY CREEK
NANCYS
LAKE EYRE NORTH
WILLIAM CREEK
HONEYMOON
NEW ANNA CREEK
NUNNS
STRANGWAYS
JACK BOOT
LETHBRIDGE
BERESFORD
ANGUS
ONE TREE
WELCOME
TRIG
MC EWIN
COWARD SPRINGS
MARGARET CREEK
LAKE EYRE SOUTH
MIRACLE SPRINGS & BORE
CURDIMURKA
SMITHS
MORRIS CREEK
CHARLES ANGUS
FINNISS
BOPEECHE
NEW YEARS GIFT
BULL PADDOCK
VENABLE
ALBERRIE CR.
DAVENPORT SPS
HERGOTT SPS
MARREE NO
MARREE
ABDUL
COOTONG
STEPHENS PONDS
TWO MILE BORE & SPRING
CALLANNA
COOKYANNA
BRANSONS
LAKE LETTIE NO 1
LAKE LETTIE NO 2
LAKE LETTIE NO
LAKE HARRY
MORRIS
PETERS
MARION
LAKE BILLY
WELL CREEK
CLARKS
CLAYTON DAM
JUNCTION
CLAYTON
TARKANINA
YARRA HILL
NICK OF TIME
CHAPIALANNA
TOONKETCHEN
ROUDANINNA
COORYANINNA
SINCLAIR
JEWELLERY CREEK
DULKANINNA
PEACHAWARINNA
CANNI WALKANINNA
(NEW) KOPPERAMANNA NO 2
(OLD) KOPPERAMANNA NO 1
MULKA
MUNGERANIE
POONARUNNA NO 1
MIRRA MITTA
KALLADEINA
MT GASON
GOYDER LAGOON
PANDIEBURRA (OIL)
PATCHAWARRA
INNAMINCKA NO 1
MERRIMELIA (OIL)
DULLINGARI (OIL)
FORTVILLE NO. 3
MONTECOLLINA
LAKE BLANCHE
METEOR
MUNDOWDNA
LAKE CROSSING
PETERMORRA
DEANS LOOKOUT
QUART POT
OLD TILCHA
TILCHA
WOOLATCHIE
COONANNA
YANDAMA
MULOOWURTINA
BOUNDARY
COONEE CREEK
COOTABARLOW 1
COOTABARLOW 3
ARBOOLA
CURRAWORRA
LAKESIDE
GLENMANYIE 1 (OLD)
GLENMANYIE 2 (NEW)
LAKE FROME
BLACK OAK
ISLAND LAGOON
BLACHFORD
HANSON
DERBY
WALES
Coober Pedy

MARREE

GEOLOGICAL SURVEY OF SOUTH AUSTRALIA
DEPARTMENT OF MINES ADELAIDE

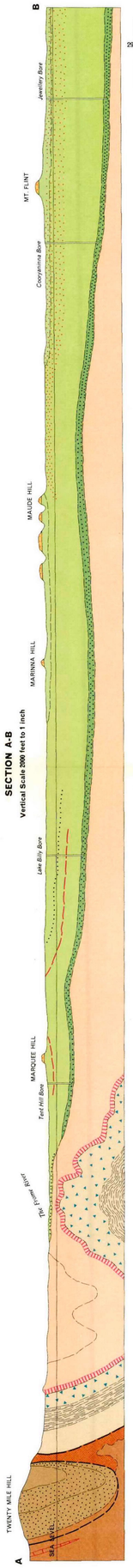
AUSTRALIA 1 : 250,000

S.A. GEOLOGICAL ATLAS SERIES SHEET H 54-5 ZONES 5 & 6

FIRST EDITION 1965

SECTION A-B

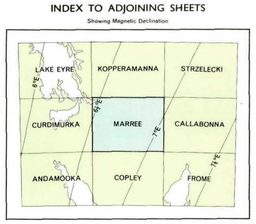
Vertical Scale 2000 feet to 1 inch



Cartography by G. L. SEMMENS

INDEX TO ADJOINING SHEETS

Showing Magnetic Declination



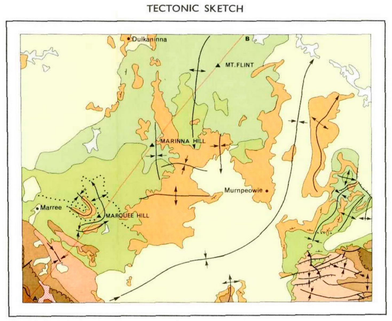
SCALE

MILES 2 1 0 2 4 6 8 10 12 14 16 18 20 MILES

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

H. J. WALL, GOVERNMENT PHOTOLITHOGRAPHER, ADELAIDE

TECTONIC SKETCH



Quaternary
Tertiary
Cretaceous
Adelaide System
Wilpena Group
Umberatana Group
Burra Group
Callanna Beds
Older Precambrian
Breccia
Fault
Fault or monoclinal fold
Thrust Fault
Anticline
Syncline
General dip
Geological section
Unconformity

REFERENCE

CAINOZOIC — QUATERNARY — RECENT

- Qrl — Saline, gypseous, clayey and silty deposits of lakes, clay-pans and swamps, (all normally dry).
- Qrt — Outwash, low-angle slope deposits, gibbers.
- Qra — Alluvium of creek beds, flood plains.
- Qrn — Thin alluvium of pediments, with minor basement outcrops.
- Qrs — Sand ridges and sand spread.

CAINOZOIC — QUATERNARY — PLEISTOCENE

- Qpt — Higher-level gravel, conglomerate and gypsum sheets, probably of various ages; possible old strand-line deposits.
- Qpm — Grey or purple mottled gypseous clays and minor ferruginous sandstones.
- Qpl — White pisolitic and banded limestone.

CAINOZOIC — TERTIARY

- Tc — ETADUNNA FORMATION: flaggy dolomite, green clay, sandstone and siltstone; Tertiary fauna.
- Ts — Duricrust: silicified sediments, usually Murnpeowie Formation, sometimes older rocks.
- Tlu — MURNPEOWIE FORMATION: sandstone, calcareous sandstone, gravel and minor clay with basal quartz-pebble conglomerate; early Tertiary plant remains.

MESOZOIC — CRETACEOUS

- Kn — BLANCHEWATER FORMATION: grey and grey-brown clayey sandstone, siltstone, shale and claystone; carbonaceous, ferruginous and cross-bedded in part; lower beds contain calcareous concretions and Albian fauna.
- Klm — MARREE FORMATION: grey claystone, shale and siltstone, with occasional sandstone and concretionary ironstone and limestone; scattered boulders near base in some areas; Aptian to Albian fauna.
  ATTRACTION HILL SANDSTONE MEMBER: lenticular coarse ferruginous sandstone, grit and conglomerate at base of Albian.
  WILPOORINNA BRECCIA MEMBER: basal slate-pebble breccia with boulders south and south-west of Marree.
  TRINITY WELL SANDSTONE MEMBER: basal cross-bedded sandstone and conglomerate in south-east.
- Klp — PELICAN WELL FORMATION: sandstone, shale and claystone in south-east containing scattered large boulders of basement rocks, basal pebbly sandstone.

MESOZOIC — JURASSIC

- Jkv — VILLAGE WELL FORMATION: pale grey fine sandstone, siltstone and claystone with local boulder bed.

PROTEROZOIC — ADELAIDE SYSTEM — STURTIAN — MARINOAN — WILPENA GROUP

- Pw — Grey-green laminated siltstone with laminated grey flaggy quartzite and brown-weathering dolomite, marble and sandy marble; minor red-brown laminated siltstone.
  Laminated grey calcareous siltstone, minor carbonate. (? WONOKA FORMATION.)
  Green silty slates (? BRACHINA FORMATION.)
  NUCCALEENA FORMATION: yellow-brown weathering laminated and flaggy or well-bedded, grey-brown dolomite.
  YERELINA FORMATION: grey laminated siltstone, slate with tillitic lenses and quartzite, sometimes overlain by massive boulder tillite.
  AMBEROONA FORMATION: grey-green or dark grey laminated siltstone sometimes with slate, dolomite.
  YANKANINNA FORMATION: white fine dolomite marble with talc in south-east, pale grey sandy dolomite in south-west.
  TAPLEY HILL FORMATION: dark laminated siltstones, coarse dolomitic sandstones, sandy dolomites and tillite.
  TINDELPINA SHALE MEMBER: finely laminated carbonaceous pyritic shale; minor dolomite.
  SERLE CONGLOMERATE MEMBER: well-bedded pebbly sandstone.
  BOLLA BOLLANNA FORMATION: boulder tillite often with dark matrix.
  FITTON FORMATION: granite tillite in south-east.

PROTEROZOIC — ADELAIDE SYSTEM — TORRENSIAN — UMBERATANA GROUP — BURRA GROUP

- Pu — Slates, greywackes, quartzites, cream and dark grey dolomites and dolomite arenites.
- Pb — Dark grey dolomites, quartzite and slates and minor magnesite conglomerate. (? SKILLOGALEE DOLOMITE EQUIVALENT.)
- Pc — Quartzite overlying dark slate.
  WITCHELINA QUARTZITE: well-bedded felspathic quartzite, showing cross-bedding and minor heavy-mineral lamination.

PROTEROZOIC — WILLOURAN — CALLANNA BEDS

- Quartzites, siltstones, slates and dolomites.
- Diapiric sediments.

OLDER PRECAMBRIAN — MT. PAINTER COMPLEX

- pCq — Sericitic quartzite with heavy-mineral lamination.
- pCm — Granitized sediments and migmatitic granite.
- pCg — Rapakivi granite and other granitic rocks.
- Dolerite.
- Quartz reefs.

GEOLOGICAL BOUNDARIES
OBSERVED
INFERRED
VERY APPROXIMATE
FAULTS
OBSERVED
INFERRED
FAULT OR MONOCLINAL FOLD
THRUST FAULT
BEDDING
INCLINED
TREND OF BEDDING
CLEAVAGE
INCLINED
VERTICAL
TYPE SECTION LOCALITIES — T.S.
FOSSIL LOCALITY
PLANT FOSSIL
MACROFOSSIL
MICROFOSSIL
EROSIONAL SCARP
MAIN ROAD
SECONDARY ROAD
TRACK
RAILWAY
BOUNDARY FENCE
VERMIN PROOF FENCE
EPHEMERAL STREAM
SWAMP
LAKE OR CLAYPAN
TRIANGULATION STATIONS
HORIZONTAL CONTROL
IDENTIFIED POINT
WATER FEATURES
BORE WITH TOTAL DEPTH IN FEET
WELL
EARTH TANK OR DAM
MINE
COPPER — Cu
SILVER — Ag
LEAD — Pb
ZINC — Zn

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