

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD No. 1964/4

GREAT ARTESIAN BASIN
BORE LOGGING,
QUEENSLAND 1961



by

F. JEWELL A. RADESKI, and E.E. JESSON

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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SUMMARY

The gamma-ray logging programme of water bores in the Great Artesian Basin, continued during 1961, revealed a fairly persistent radioactive marker taken as defining approximately the Tambo-Roma contact.

The change from Roma to Blythesdale sediments is interpreted as a change on the gamma-ray log from a uniform to a more-varied character.

Formation depths based on these criteria suggest a possible anticline in the Longreach area plunging roughly south-west.

1. INTRODUCTION

The Bureau of Mineral Resources' programme of gamma-ray logging of water bores in the Great Artesian Basin, which was begun in 1960 (Jesson, Radeski, & Jewell, 1963), was continued in 1961.

Seven bores were logged around Longreach, 12 in the Blackall-Tambo area, and eight in the Bedourie-Birdsville area (Plate 1). In many of the bores, blockages prevented logging to the bottom.

Two bores north of Longreach, Winton No. 2 (Jesson & Radeski, 1960) and Corfield No. 1 (Jewell, 1960), had been logged previously by the Bureau. In addition electric logs were available of the following:

Longreach Oil Ltd (L.O.L.) No. 1 and 2 wells,

Westland Oil Co. Ltd. (W.O.L.) No. 2 (Warbreccan) well, and

Birdsville Town Bore (Delhi-Australian Petroleum Ltd., in preparation)

Formation depths were known (G.S.Q., 1960) in Queensland Oil Development Co. Ltd. No. 1 well (Langdale).

The gamma-ray logs of Ooroonoo No. 1 (McPhee, in preparation), Betoota No. 1 (Harrison, Warner & Gibson, 1961), Buckabie No. 1 (Phillips Petroleum Co. & Sunray Mid-Continent Oil Co., 1962) wells are included in this Record.

2. GEOLOGY

The geology of the Queensland portion of the Great Artesian Basin has been discussed by Jesson, Radeski, and Jewell (1963).

The Mesozoic succession in the eastern region of the Artesian Basin is as follows:

Cretaceous	Winton Formation	
	Tambo Formation	
	Roma Formation	
Jurassic	Blythesdale Group	(Transition Beds Mooga Sandstone Fossil Wood Beds Gubberamunda Sandstone)
	Walloon Coal Measures	
Triassic	Bundamba Group	

The upper part of the Blythesdale Group may be Cretaceous. There is no definite evidence that the stratigraphic sequence in the western region of the Artesian Basin is the same as that in the east. The Cretaceous sediments found in the Boulia area have been named as follows (Casey et al., 1960):

Cretaceous	(Not recognised in Boulia area (Winton) (Wilgunya Formation (Tambo and Roma equivalent) (Longsight Sandstone (Upper Blythesdale equivalent)
Jurassic	(Absent in Boulia area (Lower Blythesdale) (Absent in Boulia area (Walloon Coal Measures)
Triassic	(Absent in Boulia area

The Toolebuc member of the Wilgunya Formation is of particular interest in relation to gamma-ray logging. This member consists of laminated and thin-bedded sandy calcarenite, calcarenous siltstone, and coquinite; it contains fossil fish scales and bones on which is deposited a uranium mineral (Casey *et al.*, 1960). The base of the Toolebuc member may, on fossil evidence, mark the boundary between the Wilgunya equivalents of the Tambo and Roma Formations.

About 200 miles south-south-east from the Boulia area the deep well Betoota No. 1 penetrated Winton sediments and also Walloon Coal Measure equivalents. The Blythesdale equivalent in this bore was placed entirely in the Jurassic.

Similarly in Ooroonoo No. 1 well, the Winton Formation and the Longsight Sandstone were recognised, the Longsight Sandstone being placed in the Jurassic.

3. EQUIPMENT AND OPERATIONS

The Failing Logmaster was used throughout the programme. The gamma-ray detector was mounted in a specially constructed vacuum flask which enabled the probe to be used to temperatures of up to 180°F.

The logs of three of the bores, *viz.* Bedourie No. 2, Birdsville Town, and Adria Downs, are open to doubt in that the equipment appeared to function erratically during the logging. Similarly, drift indicates the Figurra log may be unreliable.

Because all but one of the bores were in a non-static state during logging, the temperature observations have little practical significance other than safeguarding the gamma-ray probe. The temperature readings have been corrected for a pressure effect on the thermometers by subtracting 5°F/1000-ft depth from the observed temperatures (Ogilvie, 1954).

The elevations at those bores for which data were not available from the Irrigation & Water Supply Commission (IWSC) Lithographic Index were measured by barometric levelling. Three aircraft altimeters were read at each site and the average of the three readings was compared with pressure readings, reduced to mean sea-level, at nearby meteorological stations. The pressure difference at the site was converted to height from the tables included in the Meteorological Observer's Handbook.

Heights measured in this manner at four places of known elevation were found to be over-estimated on the average by 60⁺ 40 ft. A correction of 60 ft has therefore been subtracted from all heights by barometric levelling. The errors in the heights may be substantial owing to the large distances between the bore sites and the meteorological stations.

Five sites, viz. Breadalbane No. 9, Bore No. 11, Ludlow, Philippi No. 2, and Adria Downs were close to gravity stations that had been occupied by the Bureau of Mineral Resources helicopter gravity party in 1961. The heights measured by the gravity party, which should be accurate to ± 10 ft, have been accepted as the bore-site elevations.

4. CORRELATION OF LOGS

A list of the bores logged and the oil company wells used is given in Table 1 and the gamma-ray and lithologic logs are shown on Plates 3 to 17. Examples of suggested correlations along Cross-section AA' for Bores 30, 31, 27, and 41, and along Cross-section BB' for Bores 52, 29, 28, 32, and 33, are shown on Plates 18 and 19 respectively. The locations of the bores and correlation cross-sections are shown on Plates 1 and 2.

A bed of relatively high radioactivity appears in a monotonous sequence of lower radioactivity on most of the logs (see for example Plate 18). This bed appears to correspond to the radioactive bed found at a depth of about 1700 ft in the Corfield No. 1 bore (Jewell, 1960). It also appears on the electric log of the Corfield bore as a resistive zone and clearly correlates with the resistive bed shown on the electric log of Winton No. 2 bore at about 2430 feet (Jesson & Radeski, 1960) and with the resistive bed shown on the electric logs of L.O.L. 1, 2, 3, and 4 at depths between 1500 and 1700 feet. This bed was interpreted by Longreach Oil Ltd as marking the contact between the Tambo and Roma Formations (G.S.Q., 1960). The radioactive zone appears also on the gamma-ray logs of Ooroonoo No. 1, Betoota No. 1, and Buckabie No. 1 wells (Plates 3 & 17) and appears as a resistive zone on the electric logs of W.O.L. 2 and the Birdsville Town Bore.

The radioactive marker is not apparent on the Birdsville and Adria Downs gamma-ray logs, (No. 42 and 43, Plate 12) which are suspect on account of faulty operation of the equipment, nor is it obvious on the Forrest Hill (No. 28), Lansdowne No. 5 (No. 32), and Greendale No. 3 (No. 33) logs (Plates 5 & 7).

The Roma and Tambo Formations seem to be remarkably uniform in radioactivity, apart from the radioactive bed mentioned above.* The sequence of more-varied radioactivity below the Roma Formation, which is apparent on most of the logs, has therefore been interpreted as corresponding to the Blythesdale Group. The logs of Buckabie No. 1 and Betoota No. 1 (Plate 17), on which the stratigraphy shown is the interpretation of the oil companies, conform to the same pattern.

* The log of Bedourie No. 2 (No. 49, Plate 15) showed large fluctuations within the Roma Formation but these may have been due to an intermittent fault in the equipment.

The actual top of the Blythesdale Group, on this basis, corresponds to a decrease in radioactivity from that of the Roma Formation above. However, as the base of the Roma Formation is generally arenaceous, as are the Transition Beds (the uppermost formation of the Blythesdale Group), the boundary cannot be well-defined by logging.

The correlation cross-sections (Plates 18 & 19) show very gentle south-west dip.

The distance between some of the bores are considerable and the correlations suggested may not necessarily be correct. This is particularly true for Cross-section BB' shown on Plate 19, where there is a distance of over 100 miles between bores No. 52 and 29, and 45 miles between bores No. 28 and 32. Over these distances the character of individual beds, their thickness, and their separation may change considerably. Thus it is impossible to attach any certainty to these correlations, though they are considered to be the most reasonable interpretation.

In view of the evidence that the Tambo-Roma boundary in the Boulia area may correspond to a radioactive bed, the elevation of the base of the radioactive zone has been contoured (Plate 1) as representing approximately the elevation of the Tambo-Roma boundary. In the Winton, Longreach, Warbreccan, and Birdsville Town bores, the base of the resistive zone has been taken to mark the base of the Tambo Formation, on the evidence of electric-log correlation with the Corfield bore. Similarly the base of the Roma Formation, as picked on the logs, has also been contoured (Plate 2).

The logs and correlation cross-sections suggest that there is not much variation in the thickness of the Roma Formation, and the form of the two contour maps is substantially the same.

As so few of the bores penetrated below the base of the Blythesdale Group, mapping of deeper formations has not been attempted.

5. TEMPERATURE LOG OF BORE NO. 31

As explained previously the temperature data have little practical value because of the non-static conditions in the bores; however, the temperature log of Bore 31 warrants comment because of its unexpected shape (Plate 6).

From the surface to a depth of about 2650 ft there was a gradual increase in temperature from 145°F to 158°F. The temperature then dropped suddenly by about 2°F, remained steady for the next 200-ft increase in depth, dropped suddenly again by about 1°F, and then resumed its gradual increase with depth.

This feature repeated on the down and up-logs, apart from a vertical displacement of about 25 ft which is probably explained by the slow sinking of the probe against the upward rush of the water on the downward run.

Both of the sudden temperature decreases coincide in position with zones of low radioactivity which indicate sandstone beds. The lithologic log indicates that the lower of these sandstones is an aquifer and this is probably also true of the upper one.

Thus it appears that in the region between 2650 and 2850 ft, the hottest water is entering the bore at the shallowest depth. This conclusion is unexpected but can probably be explained by water flowing between various aquifers outside the casing and entering the bore, though perforations, at depths not corresponding to the aquifer(s) from where it originated. A similar effect would result from the interchange of water between aquifers via local faulting.

6. CONCLUSIONS

The radioactive bed taken as depicting the Tambo-Roma contact has made correlation of the logs less doubtful than it was in the 1960 programme, although there is still some doubt where this radioactive feature is not clear and where bores are widely spaced. The contours indicate an anticline plunging roughly south-west in the Longreach area.

The base of the Roma Formation, taken as corresponding to a change to a more-varied radioactivity, is not well-defined where this formation includes basal sandstones overlying the sandy Transition Beds.

Further work is required to improve the interpretation.

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GAMMA RAY LOGGING, GREAT ARTESIAN BASIN, QUEENSLAND

Table 1
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INDEX OF BORES

LOG NUMBER	IWSC REG. NO.	NAME	4-MILE MAP REFERENCE		LOCATION				DEPTH DRILLED	DEPTH LOGGED	ELEVATION OF LOG REF. LEVEL	B.M.R. DRAWING NUMBER	REMARKS
			QUEENSLAND	MILITARY	LAT.	MILES NORTH	LONG.	MILES EAST					
25	2628	Evesham Lease No. 1	64	Winton	23°00'	0.1	143°30'	3.9	4150	2900	780(b)	F54/B6-1	
26	4897	Wellshot No.8	55	Longreach	24°00'	13.8	144°00'	19.9	3814	3765	837	F55/B6-1	
27	94	Middle Park	44	Tambo	24°30'	1.4	145°30'	7.1	3000	2700	998	F55/B6-1	obstruction at 2705 ft.
28	4060	Forrest Hill	44	Augathella	25°15'	10.4	145°30'	4.3	3536	3420	1172	G55/B6-33	
29	120	Pigurra	44	Augathella	25°15'	11.4	145°30'	0.0	3811	3790	1141	G55/B6-33	
30	4497	Athol No. 1	44	Blackall	25°00'	20.2	145°00'	11.2	3450	3100	875(b)	G55/B6-34	obstruction at 3140 ft.
31	378	Burra Burra	44	Blackall	25°00'	24.9	145°00'	20.4	3073	3000	912	G55/B6-34	
32	3339	Lansdowne No. 5	44	Augathella	25°15'	14.9	146°00'	17.9	4013	3060	1384	G55/B6-35	obstruction at 3062 ft.
33	5013	Greendale No.3	44	Tambo	25°00'	13.3	146°00'	7.1	3185	3183	1320(b)	G55/B6-35	
34	14479	Terrick-Terrick Block 1105	44	Blackall	25°00'	6.4	145°00'	5.3	2025	2010	1000(e)	G55/B6-36	obstruction at 2015 ft.
35	4891	Dartmouth	55	Longreach	24°00'	18.2	144°30'	6.4	2639	1930	920	G55/B6-36	obstruction at 1940 ft.
36	14588	Blackall Town	44	Blackall	24°30'	4.3	145°00'	29.4	1482	1480	938	G55/B6-37	
37	1926	Rand	64	Longreach	23°15'	9.2	144°30'	7.3	2760	1540	759	G55/B6-37	obstruction at 1550 ft.
38	3489	Springleigh	45	Blackall	25°00'	29.4	144°30'	14.9	7009	1100	969	F55/B6-2	obstruction at 2136 ft. temp. limit of probe 1100 ft.
39	4253	Woolbrook	55	Longreach	23°30'	3.0	144°30'	29.3	1440 ?	920	820(b)	F55/B6-2	
40	377	Glenusk	44	Tambo	24°30'	13.8	145°30'	10.3	2384	1280	1044	G55/B6-38	partial obstruction 1280 ft. obstruction at 1366 ft.
41	14579	Northampton Downs	44	Tambo	24°30'	7.8	145°30'	18.3	1124	1120	1130	G55/B6-38	
42	14045	Birdsville Town	37	Birdsville	26°00'	6.5	139°00'	22.0	4000	3390	164	G55/B6-4	gamma ray probe failed at elevated temperature
43	13088	Adria Downs	38	Birdsville	26°00'	29.8	138°30'	30.6	3090	1220	235(b)	G55/B6-4	gamma ray probe failed at elevated temperature
44	1450	Fullerton	55	Longreach	23°30'	10.6	144°30'	14.5	2320	2000	804	F55/B6-3	partial obstruction at 2009 ft G 16-10-1

elevations by : (b) barometric levelling, (e) estimated.

To Accompany Record No 1964/4

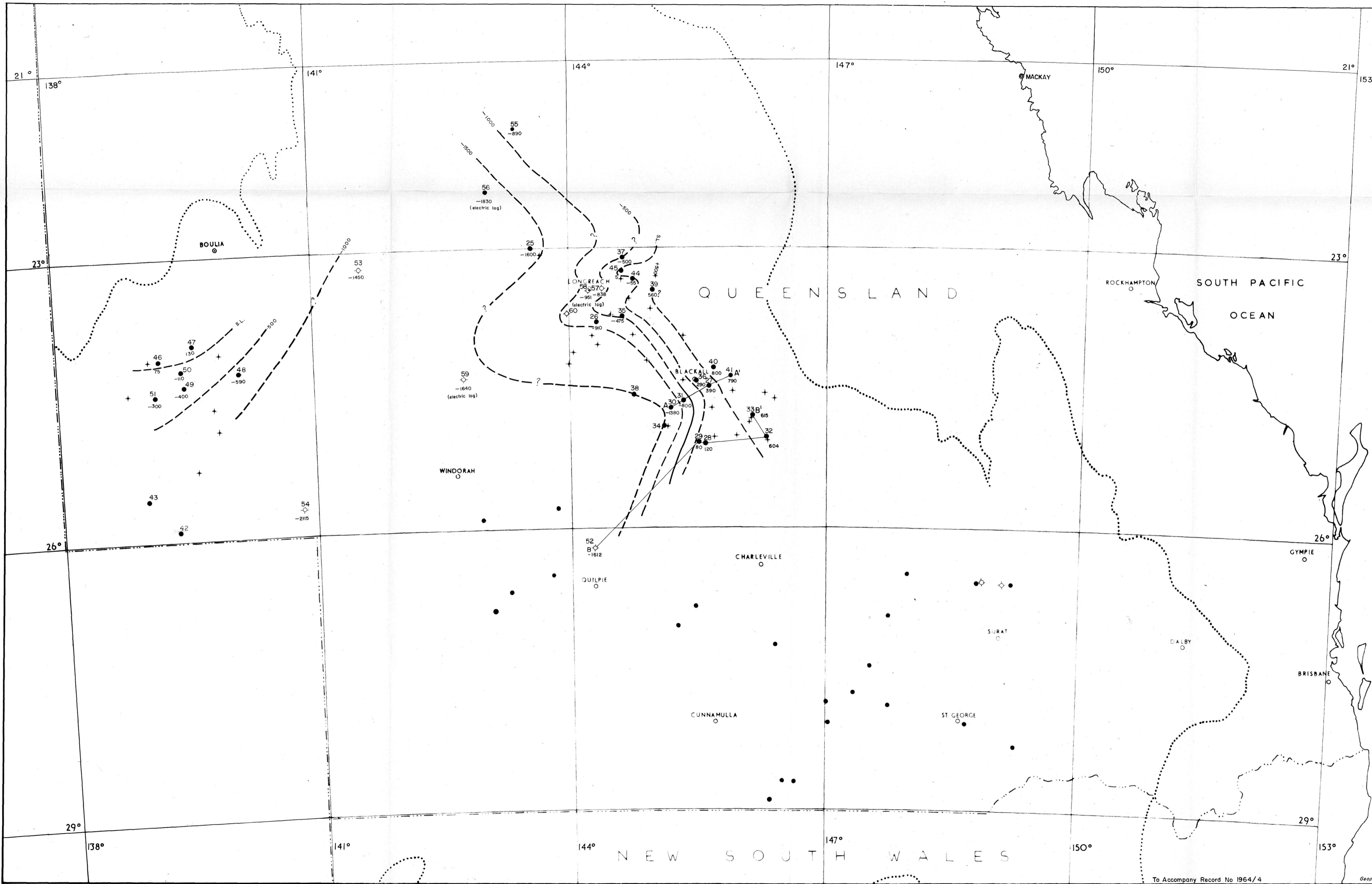
GAMMA RAY LOGGING, GREAT ARTESIAN BASIN, QUEENSLAND

Table 1
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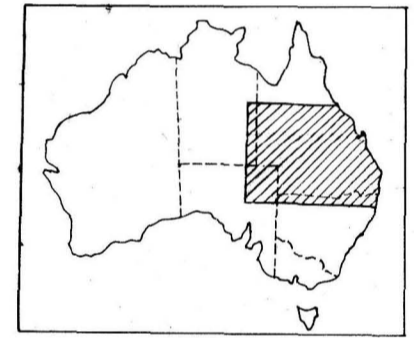
INDEX OF BORES

LOG NUMBER	IWSC REG. NO.	NAME	4-MILE MAP REFERENCE		LOCATION				DEPTH DRILLED	DEPTH LOGGED	ELEVATION OF LOG REF. LEVEL	BMR DRAWING NUMBER	REMARKS
			QUEENSLAND	MILITARY	LAT.	MILES NORTH	LONG.	MILES EAST					
45	1456	Balmoral	55	Longreach	23°30'	16.7	144°30'	6.1	1385	1140	707	F55/B6-3	obstruction at 1144 ft
46	4322	Sandringham No. 4	58	Bedourie	24°15'	12.2	139°00'	11.2	775	460	331	F54/B6-2	obstruction at 461 ft
47	1668	Breadalbane No. 9	58	Machattie	24°00'	4.7	139°30'	5.1	780	650	360(b)	F54/B6-2	obstruction at 661 ft
48		Bore 11	48	Machattie	24°30'	17.5	140°00'	7.8	?	1350	362(b)	G54/B6-5	
49	316	Bedourie No.2	48	Bedourie	24°30'	8.9	139°00'	29.8	1314	1250	307	G54/B6-5	
50	12040	Ludlow	58	Bedourie	24°15'	3.3	139°00'	28.2	1025	900	305(b)	G54/B6-6	obstruction 903 ft
51	13149	Philippi No.2	48	Bedourie	24°30'	2.5	139°00'	8.2	1226	1050	246(b)	G54/B6-6	obstruction 1069 ft
52		Buckabie No.1	25	Quilpie	26°30'	20.9	144°00'	16.5	9070	9070	738	G55/B6-39	Philips Petroleum Co., see PSSA Publ. No. 41
53		Ooroonoo No.1	57	Brighton Downs	23°30'	21.7	141°30'	3.3	3852	Electric 3852, Gamma 2100	405	F54/B6-3	Conorada Petroleum Co., see PSSA Publ. (in preparation)
54		Betoota No.1	36	Betoota	26°00'	20.1	140°30'	20.6	9824	9824	359	G54/B6-7	Delhi Australian Petroleum Ltd, see PSSA Publ. No. 10
55	14125	Corfield No.1	74	Manuka	22°00'	19.8	143°00'	24.1	2511	2450	844	966	
56	14269	Winton No.2	65	Winton	22°30'	8.1	143°00'	3.0	4016	4010	617	G295-9	electric logs only
57		L.O.L. No.1	55	Longreach	23°30'	4.8	144°00'	24.9	3068	3068	712		Longreach Oil Ltd, electric logs only
58		L.O.L. No.2	55	Longreach	23°30'	4.0	144°00'	16.6	3224	3224	639		Longreach Oil Ltd, electric logs only
59		W.O.L. No.2	46	Jundah	24°30'	5.5	142°30'	17.9	5224	4570	782		Westland Oil Co. Ltd electric logs only.
60		Q.O.D. No. 1	55	Maneroo	24°00'	21.6	143°30'	30.5	2520	-	660		Queensland Oil Development Co. Ltd., not logged.
					(b) elevations by barometric levelling.								

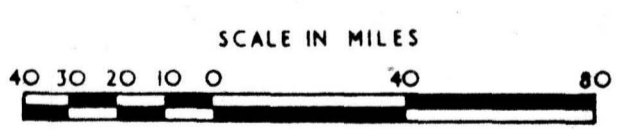
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- LEGEND
- State boundary
 - Water bore No. 3 (logged by B.M.R.) (Base of marker 390 ft a.s.l.)
 - + Water bore (not logged)
 - ◊ Oil Co. bore (logged by Company) (Base of marker 1000 ft b.s.l.)
 - Approximate limit of Great Artesian Basin
 - A—A' Correlation cross-section (Plate 20)
 - B—B' " " " (Plate 21)

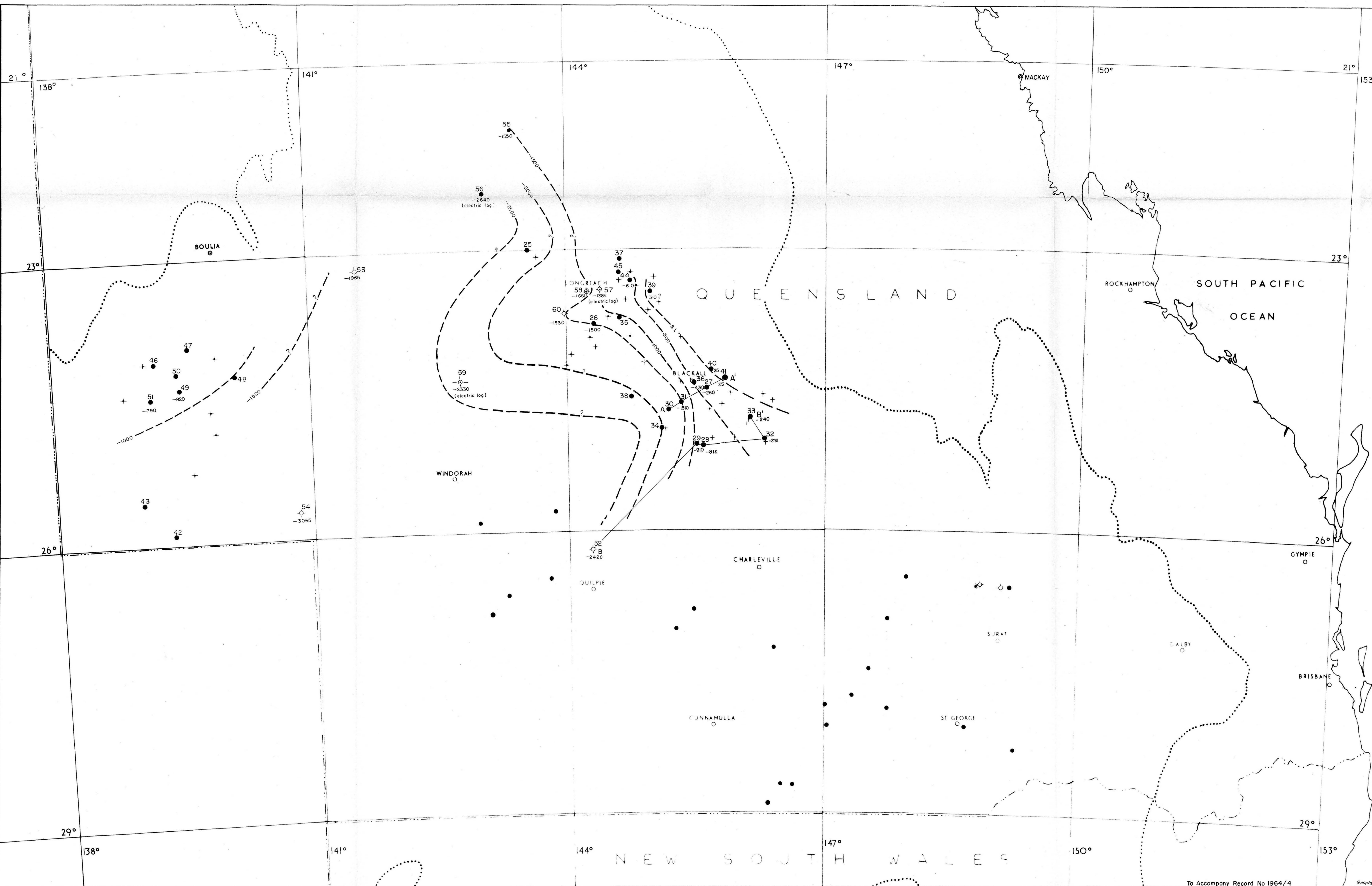


NOTE: FIGURES AGAINST BORES REFER TO BORE LIST, TABLE I.



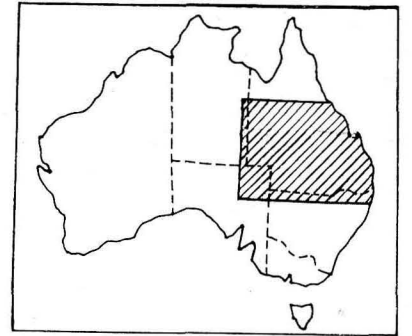
GREAT ARTESIAN BASIN,
S.W. QUEENSLAND.
EXPERIMENTAL BORE LOGGING
PROGRAMME 1961.

LOCALITY MAP
SHOWING ELEVATION OF BASE OF MARKER ZONE
(APPROXIMATELY BASE OF TAMBO FORMATION)

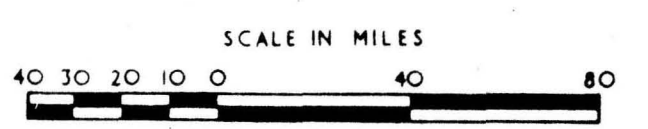


- LEGEND**
- State boundary
 - Water bore No. 3 (logged by B.M.R.)
(Base of Roma Formation 260 feet b.s.l.)
 - + Water bore (not logged)
 - ⊙ Oil Co. bore (logged by Company or by B.M.R.)
(Base of Roma formation 1500 ft b.s.l.)
 - Approximate limit of Great Artesian Basin
 - A—A' Correlation cross-section (Plate 20)
 - B—B' " " " (Plate 21)

N.B. At bore No. 36 (Q.O.D.I.), elevation of base of Roma formation is taken from G.S.Q. Publ. 299, not from logging.



NOTE: FIGURES AGAINST BORES REFER TO BORE LIST, TABLE 1.



**GREAT ARTESIAN BASIN,
S.W. QUEENSLAND.
EXPERIMENTAL BORE LOGGING
PROGRAMME 1961**

LOCALITY MAP
SHOWING ELEVATIONS OF BASE OF ROMA
FORMATION ESTIMATED FROM LOGS

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

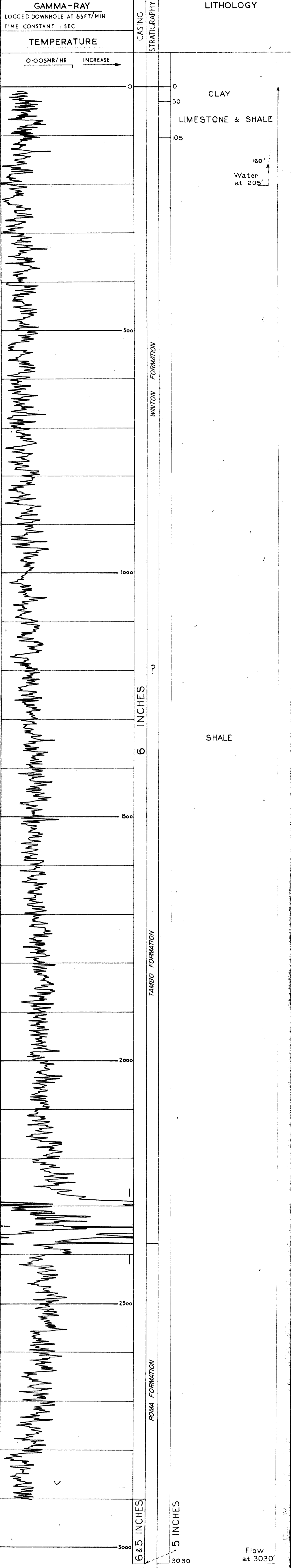
EVESHAM LEASE No.1
(25)

IW.S.C. REGISTERED No.: 2628 COORDINATES: 23°00'S, 0.1 MILE'S NORTH
OWNER: 143°30'E, 3.9 MILE'S EAST.
DRILLED: 1910. ELEVATION: GROUND 780'
DEPTH, DRILLER: 4150' REF. LEVEL 780'
BORE CONDITION: FLOWING WATER. LOGGED BY: A. RADESKE
LOGGING EQUIPMENT: FAILING LOGMASTER LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	
DATE	28-11-61		28-11-61	
FIRST READING			10	
LAST READING			2903	
FOOTAGE LOGGED			2893	

REMARKS: DEPTHS CORRECTED FOR CABLE STRETCH.
EXPERIMENTAL HIGH-TEMPERATURE GAMMA-RAY PROBE.

STRATIGRAPHY BY CORRELATION



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

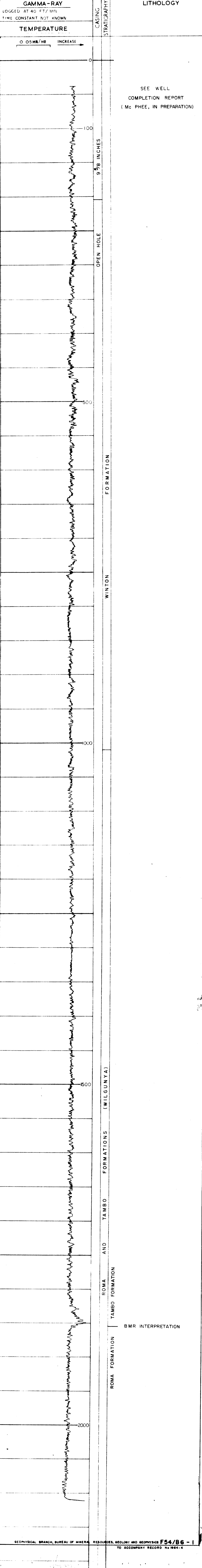
CONORADA 00R00N00 No.1
(53)

IW.S.C. REGISTERED No.: COORDINATES: 23°30'S, 21.7 MILES NORTH
OWNER: CONORADA PETROLEUM Co 141°30'S, 3.3 MILES EAST.
DRILLED: 1960 ELEVATION: GROUND 400'
DEPTH, DRILLER: 3852' REF. LEVEL 405'
BORE CONDITION: STANDING, MUD LOGGED BY: MINES ADMIN (J.E. BURBURY)
LOGGING EQUIPMENT: FAILING LOGMASTER LITHOLOGY BY: MINES ADMIN

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	
DATE			21-8-62	
FIRST READING			38	
LAST READING			2105	
FOOTAGE LOGGED			2067	

REMARKS

STRATIGRAPHY BY OIL COMPANY



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

WELLSHOT No. 8.
(26)

IW.S.C. REGISTERED No.: 4897. COORDINATES: 24° 00' 21.5 MILES NORTH
OWNER: PRIVATE. 144° 00' 27.4 MILES EAST
DRILLED: 1918. ELEVATION: GROUND 837'.
DEPTH, DRILLER: 3814'. REF. LEVEL 837'.
BORE CONDITION: PUMPED, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER.
LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	1-11-61		1-11-61
FIRST READING	0		3765
LAST READING	3769		20
FOOTAGE LOGGED	3769		3745

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.
EXPERIMENTAL HIGH-TEMPERATURE GAMMA-RAY PROBE.

STRATIGRAPHY BY CORRELATION

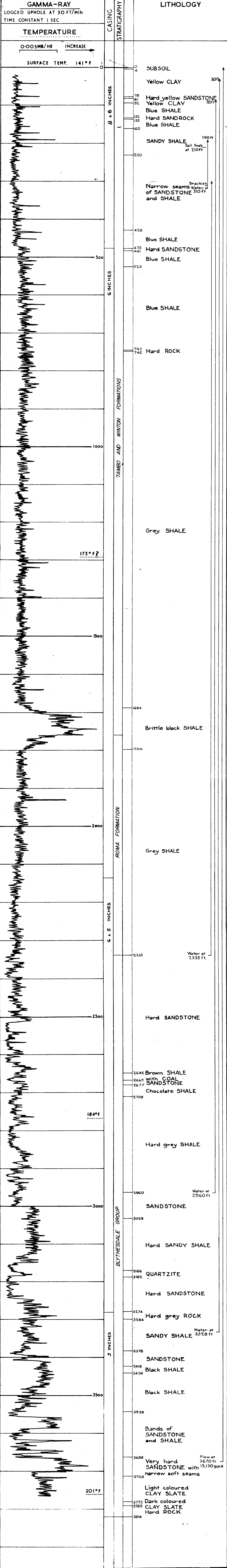


PLATE 4

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

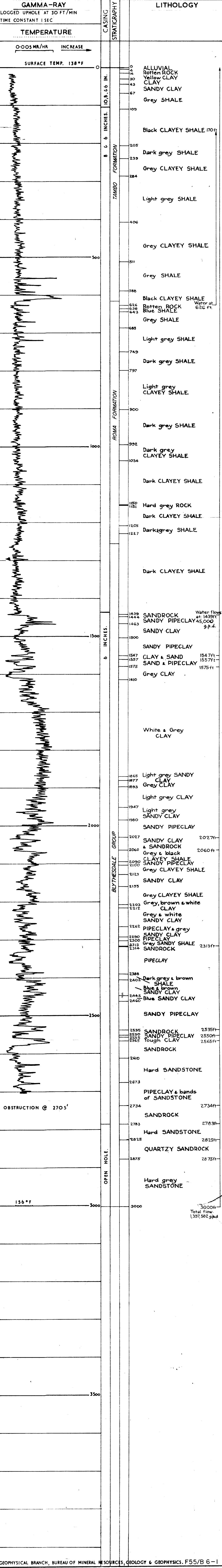
MIDDLE PARK.
(27)

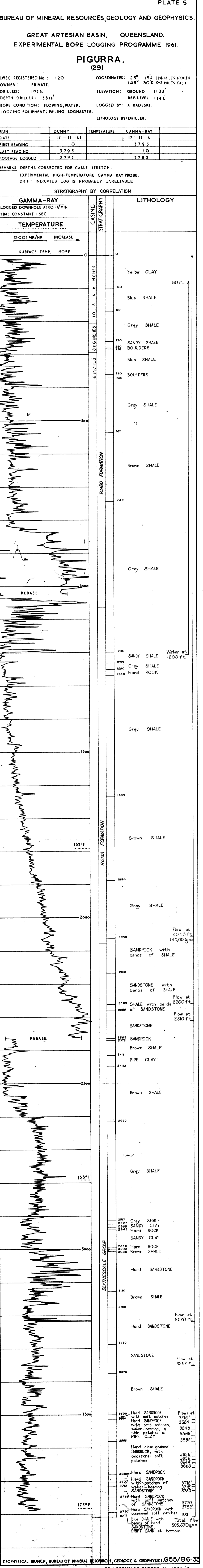
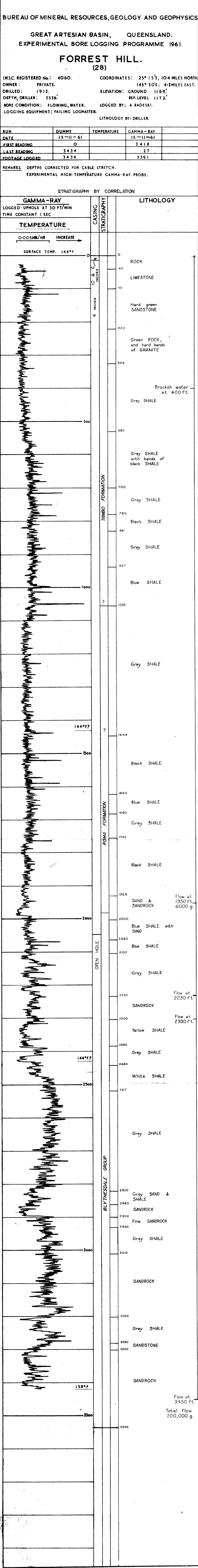
IW.S.C. REGISTERED No.: 94. COORDINATES: 25° 00' 24.6 MILES NORTH
OWNER: TRUST. 145° 30' 6.9 MILES EAST
DRILLED: 1910. ELEVATION: GROUND 992'.
DEPTH, DRILLER: 3000'. REF. LEVEL 992'.
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER.
LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	20-11-61		20-11-61
FIRST READING	0		2705
LAST READING	3018		17
FOOTAGE LOGGED	3018		2688

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.
EXPERIMENTAL HIGH-TEMPERATURE GAMMA-RAY PROBE.

STRATIGRAPHY BY CORRELATION





GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

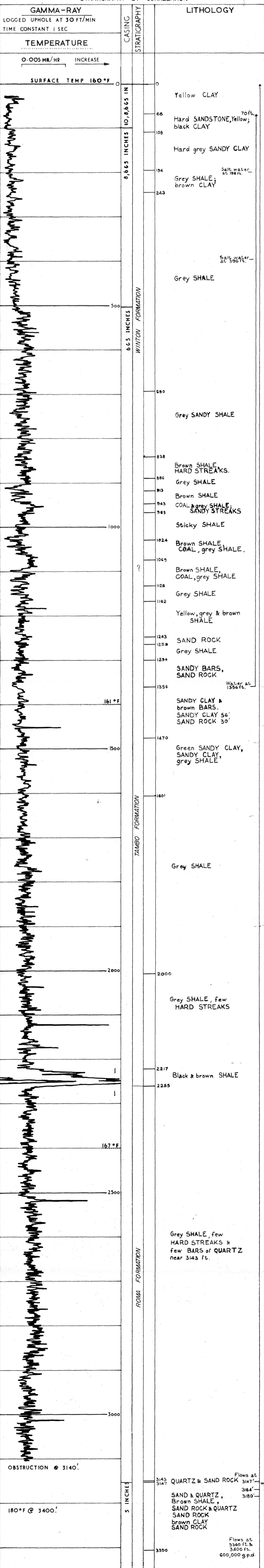
ATHOL No. 1.
(30)

I.W.S.C. REGISTERED No.: 4497. COORDINATES: 25°00'S, 20.2 MILES NORTH.
OWNER: PRIVATE. 145°00'E, 11.2 MILES EAST.
DRILLED: 1914. ELEVATION: GROUND 875'
DEPTH, DRILLER: 3450'. REF. LEVEL 875'
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER.
LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	
DATE	23-11-61		23-11-61	
FIRST READING	0		3103	
LAST READING	3403		25	
FOOTAGE LOGGED	3403		3078	

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.
EXPERIMENTAL HIGH-TEMPERATURE GAMMA-RAY PROBE.

STRATIGRAPHY BY CORRELATION



GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

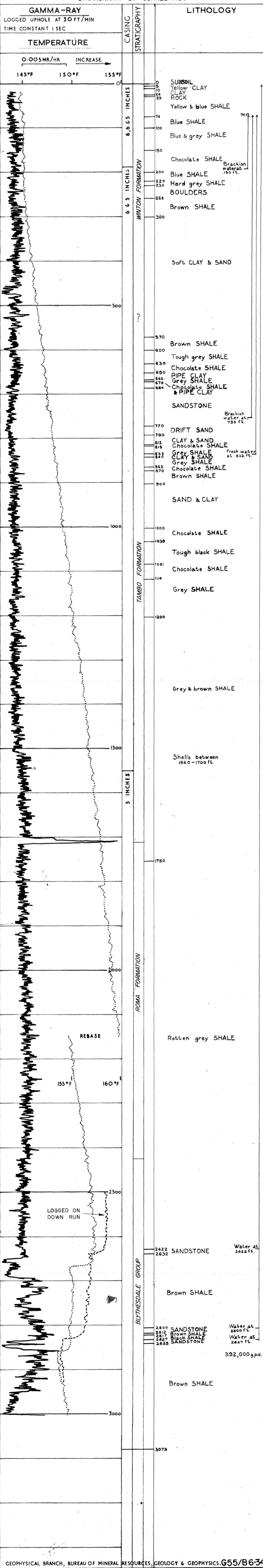
BURRA BURRA.
(31)

I.W.S.C. REGISTERED No.: 378. COORDINATES: 25°00' 25.5 MILES NORTH
OWNER: PRIVATE. 145°00' 20.5 MILES EAST
DRILLED: 1910. ELEVATION: GROUND 912'
DEPTH, DRILLER: 3073'. REF. LEVEL 912'
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER.
LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	TEMPERATURE
DATE	21-11-61		21-11-61	21-11-61
FIRST READING		3003	3003	2500
LAST READING		19	19	3003
FOOTAGE LOGGED		2984	2984	503

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.
EXPERIMENTAL HIGH-TEMPERATURE GAMMA-RAY PROBE.

STRATIGRAPHY BY CORRELATION



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

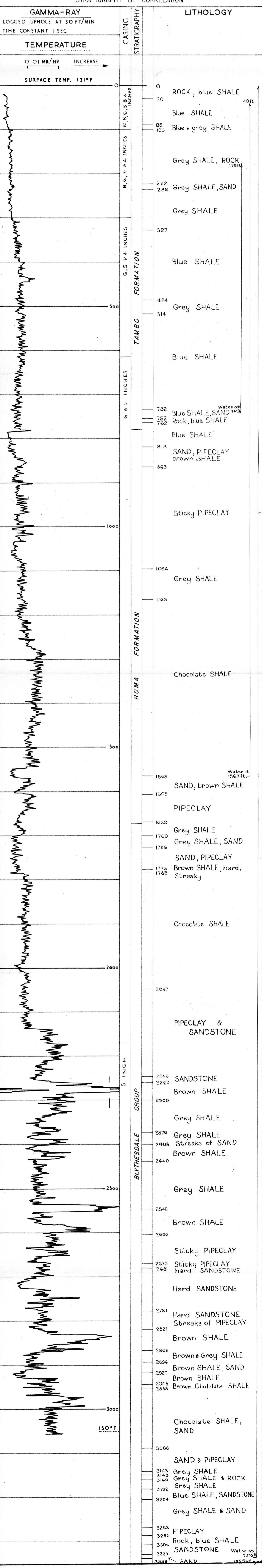
LANSDOWNE No.5.
(32)

I.W.S.C. REGISTERED No.: 3339. COORDINATES: 25° 15' S, 14-9 MILES NORTH.
OWNER: PRIVATE. 146° 00' E, 17-9 MILES EAST.
DRILLED: 1915. ELEVATION: GROUND 1384'.
DEPTH, DRILLER: 4013'. REF. LEVEL 1384'.
BORE CONDITION: PUMPED, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER. LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	25-10-61		25-10-61
FIRST READING	0		30 53
LAST READING	3062		19
FOOTAGE LOGGED	3062		30 34

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.

STRATIGRAPHY BY CORRELATION



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

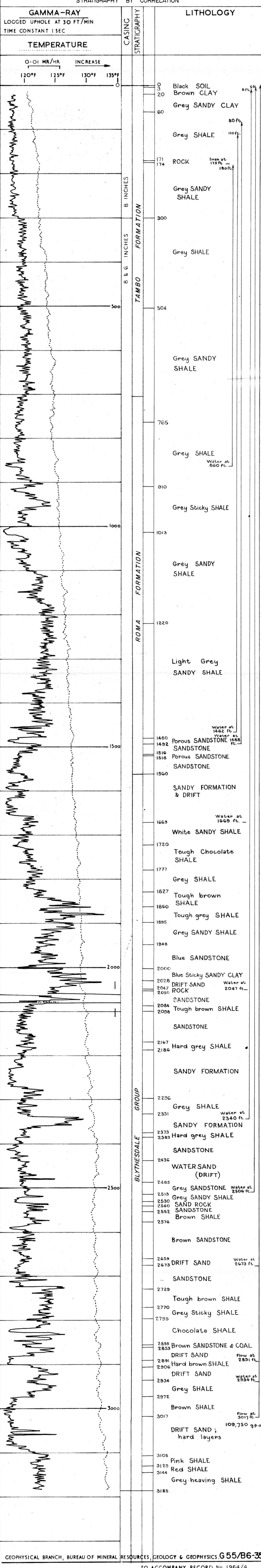
GREENDALE No.3.
(33)

I.W.S.C. REGISTERED No.: 5013. COORDINATES: 24° 30' S, 17-8 MILES NORTH.
OWNER: PRIVATE. 146° 00' E, 8-5 MILES EAST.
DRILLED: 1935. ELEVATION: GROUND 1320'.
DEPTH, DRILLER: 3185'. REF. LEVEL 1320'.
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER. LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	24-10-61		24-10-61
FIRST READING	0		318 3
LAST READING	3189		20
FOOTAGE LOGGED	3189		316 3

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.

STRATIGRAPHY BY CORRELATION



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

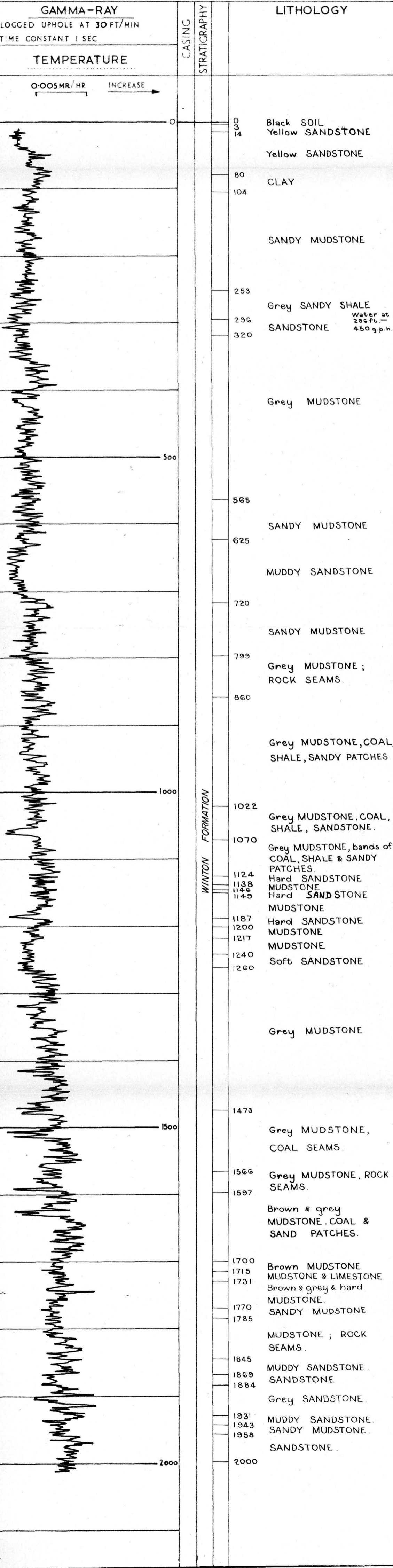
GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

TERRICK-TERRICK FLOCK.
(34)

I.W.S.C. REGISTERED No.: 14479 COORDINATES: 25°00'S, 6.4 MILES NORTH
OWNER: PRIVATE. 145°00'E, 5.3 MILES EAST.
DRILLED: 1961. ELEVATION: GROUND 1000' APPROX
DEPTH, DRILLER: 2025' REF. LEVEL " " " "
BORE CONDITION: PUMPED 2, WATER LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER. LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	18-10-61		18-10-61
FIRST READING	0		2012
LAST READING	2015		10
FOOTAGE LOGGED	2015		2002

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

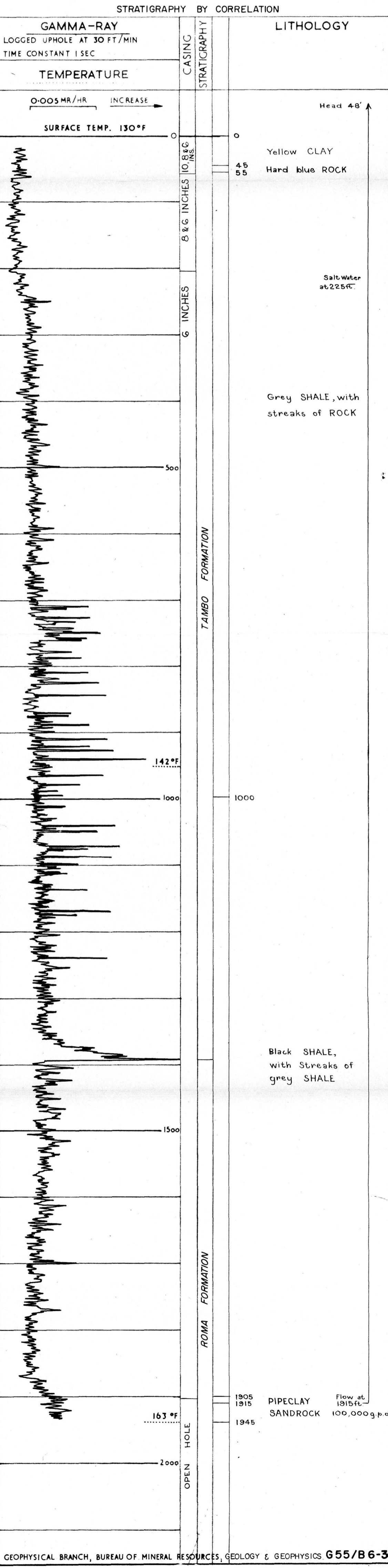
GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

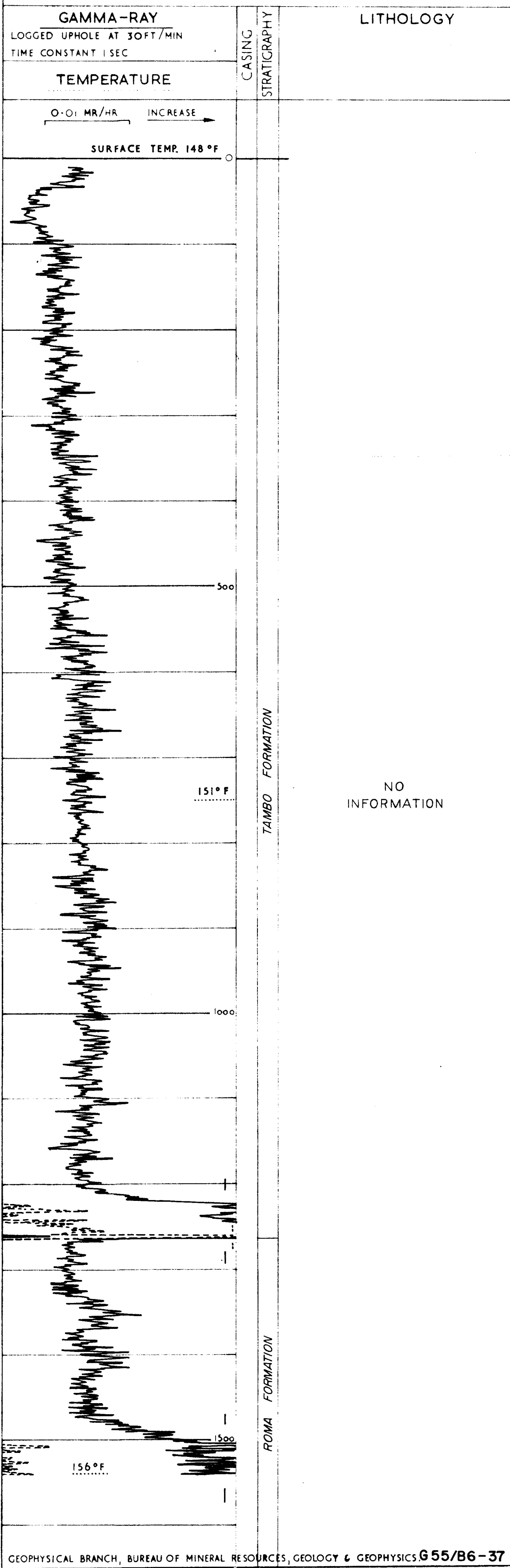
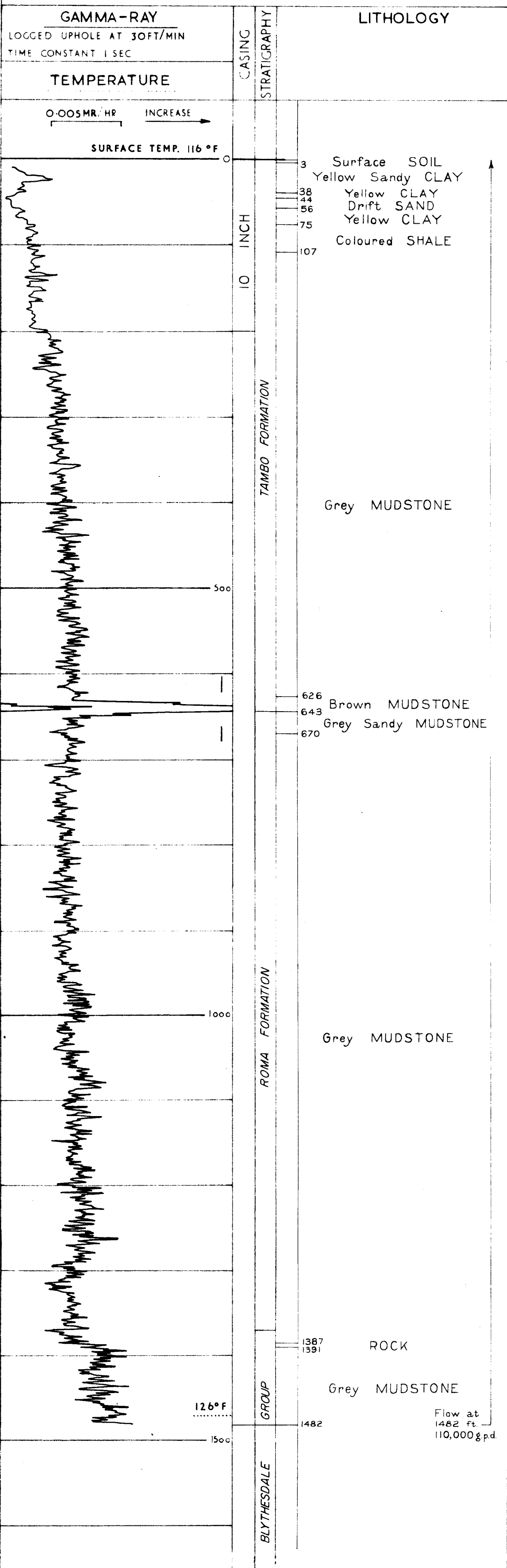
DARTMOUTH.
(35)

I.W.S.C. REGISTERED No.: 4891. COORDINATES: 24°00' 17.6 MILES NORTH
OWNER: PRIVATE. 144°30' 6.6 MILES EAST
DRILLED: 1894. ELEVATION: GROUND 913'
DEPTH, DRILLER: 2639' REF. LEVEL 920'.
BORE CONDITION: FLOWING, WATER LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER. LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	31-10-61		31-10-61
FIRST READING	0		1932
LAST READING	1940		18
FOOTAGE LOGGED	1940		1914

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.
EXPERIMENTAL HIGH-TEMPERATURE GAMMA-RAY PROBE.





GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

SPRINGLEIGH.
(38)

I.W.S.C. REGISTERED No.: 3489.

OWNER : PRIVATE.

DRILLED: 1921.

DEPTH, DRILLER: 7009'

BORE CONDITION: FLOWING, WATER.

LOGGING EQUIPMENT: FAILING LOGMASTER.

COORDINATES: 25° 00'S, 29.4 MILES NORTH.

144° 30'E, 14.9 MILES EAST.

ELEVATION: GROUND 968'

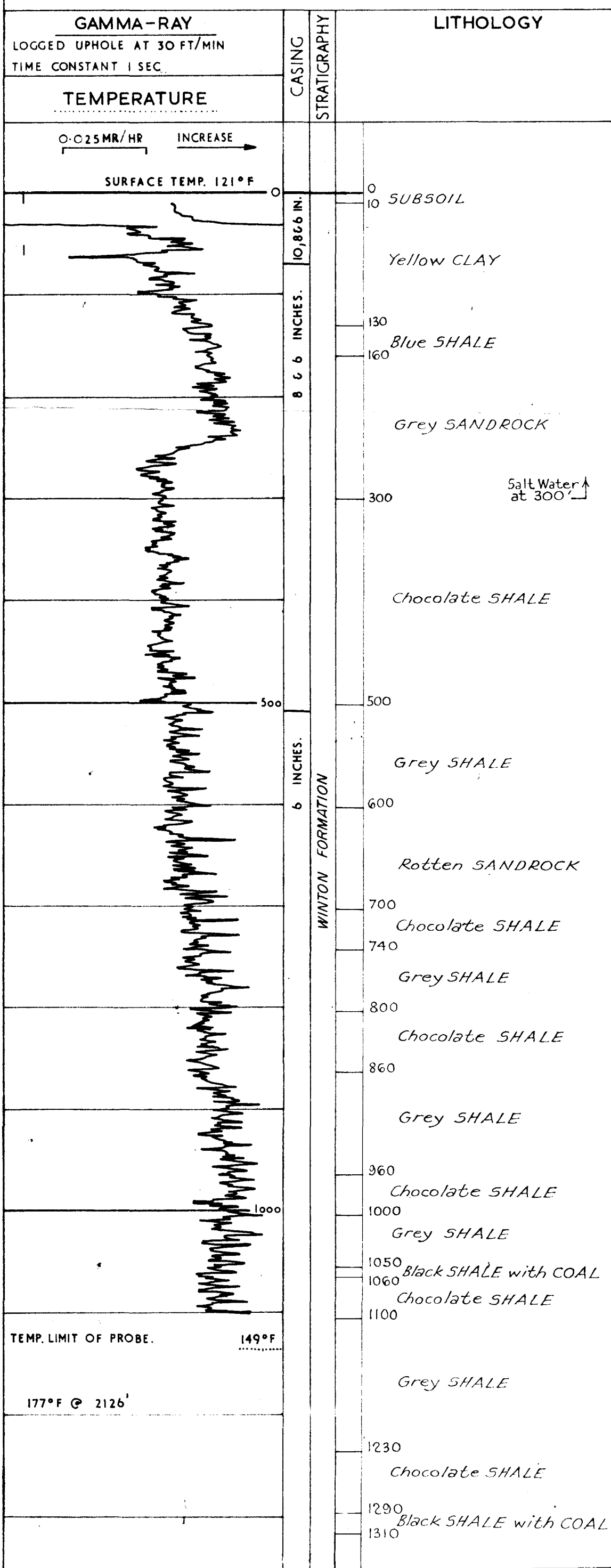
REF. LEVEL 969'

LOGGED BY: A. RADESKI.

LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	19-10-61		19-10-61
FIRST READING	0		1101
LAST READING	2136		10
FOOTAGE LOGGED	2136		1091

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.



GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

WOOLBROOK.
(39)

I.W.S.C. REGISTERED No.: 4253.

OWNER: PRIVATE.

DRILLED: 1911 ?

DEPTH, DRILLER: 1440'?

BORE CONDITION: FLOWING, WATER.

LOGGING EQUIPMENT: FAILING LOGMASTER.

COORDINATES: 23° 30'S, 3.0 MILES NORTH.

144° 30'E, 29.3 MILES EAST.

ELEVATION: GROUND 820'

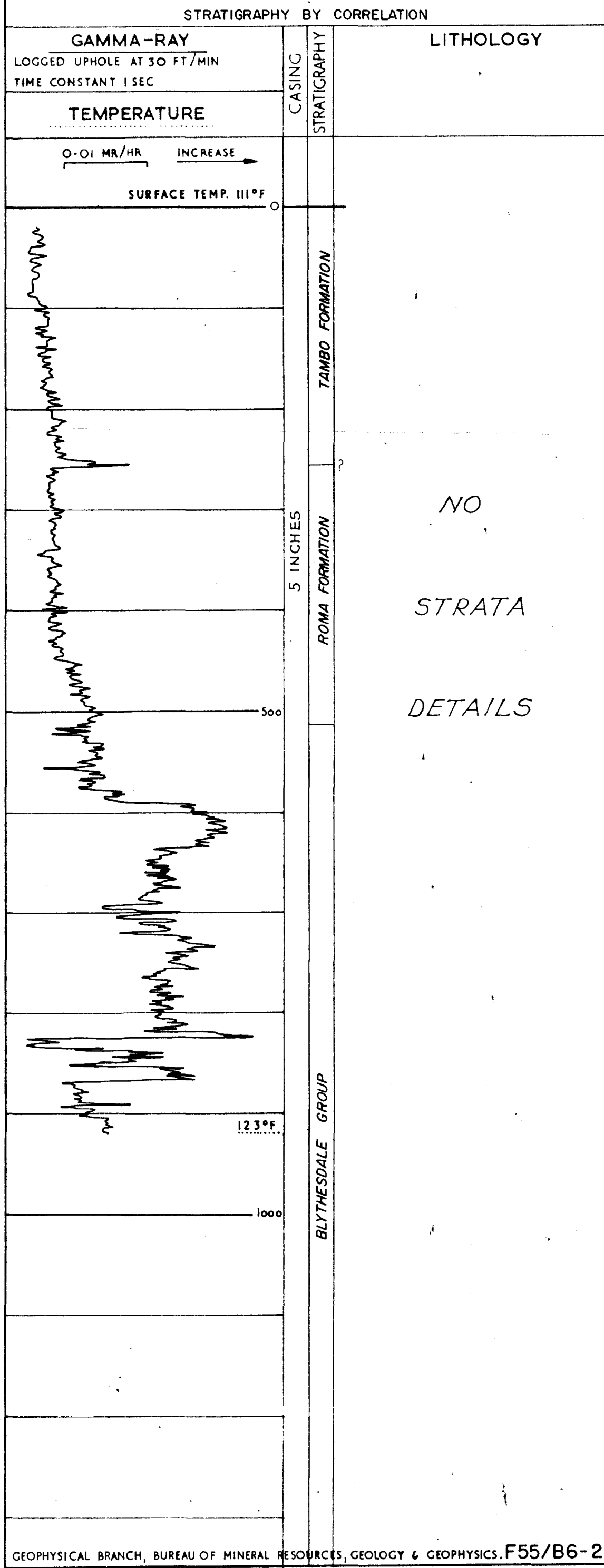
REF. LEVEL 820

LOGGED BY: A. RADESKI.

LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	
DATE	12 - 10 - 61		#2 - 10 - 61	
FIRST READING	0		9 2 1	
LAST READING	?		2 0	
FOOTAGE LOGGED			9 0 1	

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

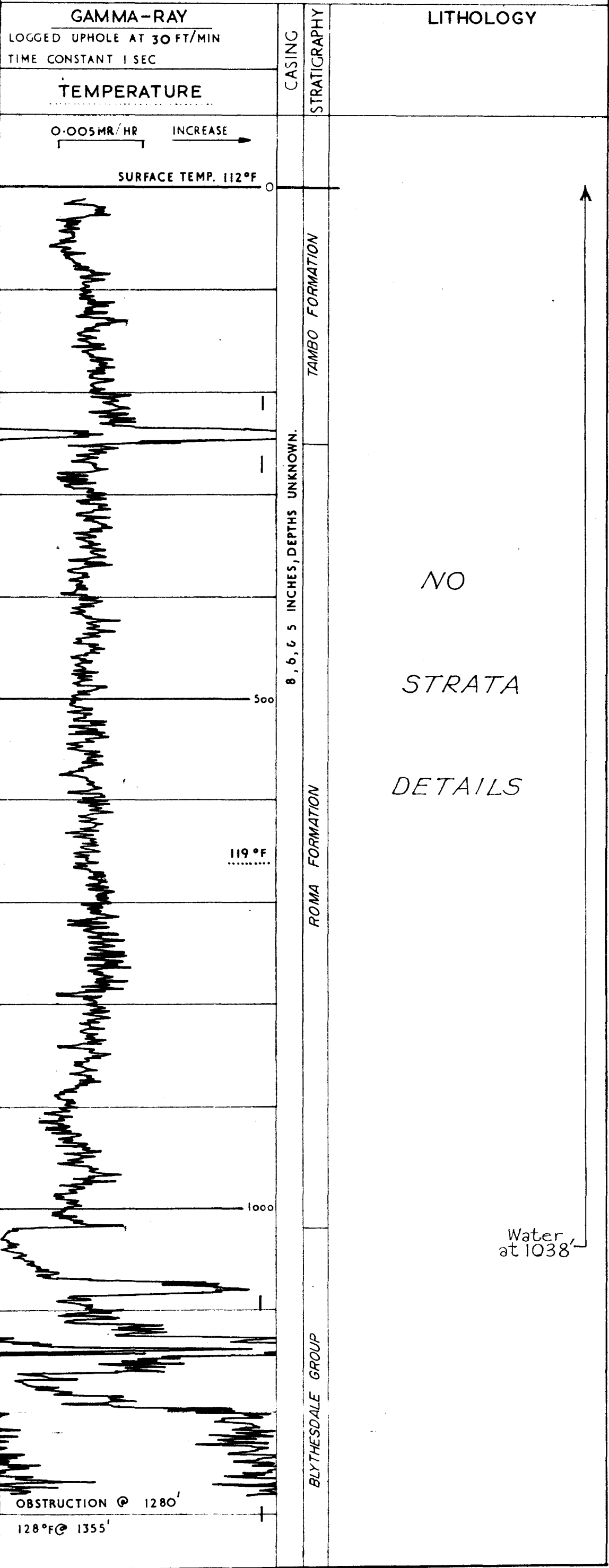
GLENUSK.
(40)

IW.S.C. REGISTERED No.: 377. COORDINATES: 24° 30'S, 13.8 MILES NORTH.
OWNER: PRIVATE. 145° 30'E, 10.3 MILES EAST.
DRILLED: 1904. ELEVATION: GROUND 1044'.
DEPTH, DRILLER: 2384'. REF. LEVEL 1044'.
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER. LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	5-10-61		5-10-61
FIRST READING	0		1281
LAST READING	1366		10
FOOTAGE LOGGED	1366		1271

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.

STRATIGRAPHY BY CORRELATION



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

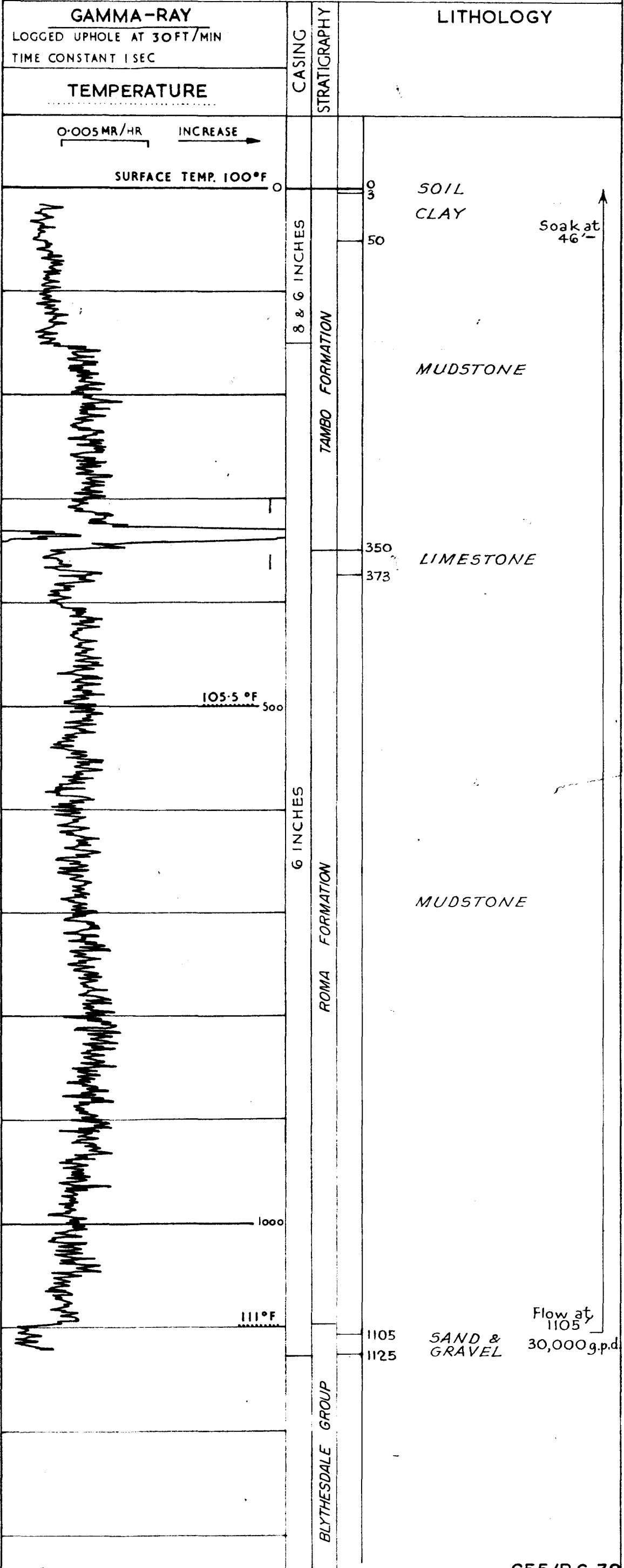
NORTHAMPTON DOWNS.
(41)

IW.S.C. REGISTERED No.: 14579. COORDINATES: 24° 30'S, 7.8 MILES NORTH.
OWNER: 145° 30'E, 18.3 MILES EAST.
DRILLED: 1961. ELEVATION: GROUND 1130'.
DEPTH, DRILLER: 1124'. REF. LEVEL 1130'.
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER. LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	6-10-61		6-10-61
FIRST READING	0		1121
LAST READING	1122		15
FOOTAGE LOGGED	1122		1106

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.

STRATIGRAPHY BY CORRELATION



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

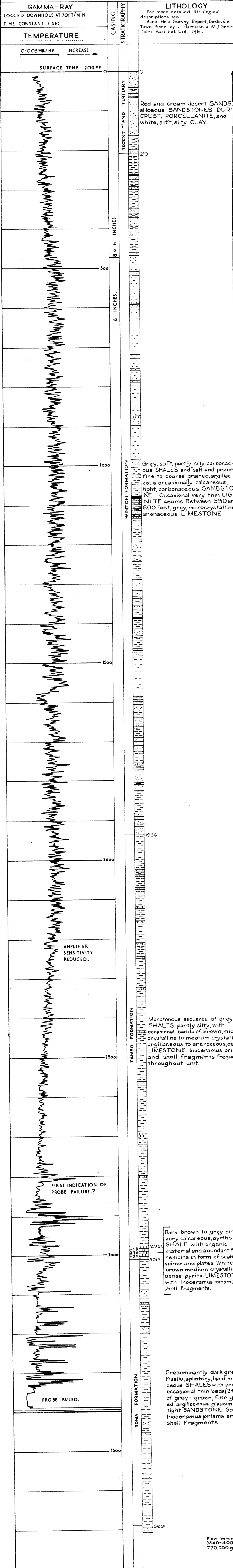
BIRDSVILLE TOWN
(42)

IW.S.C. REGISTERED No.: 14645. COORDINATES: 26°00'S, 6.5 MILES NORTH
OWNER: TOWN. 139°00'E 22 MILES EAST
DRILLED: 1961. ELEVATION: GROUND 161'
DEPTH, DRILLER: 4006' REF. LEVEL 164'
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER. LITHOLOGY BY: Delhi Aust. Pty. Ltd

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE			17-9-61
FIRST READING			10
LAST READING			3400
FOOTAGE LOGGED			3390

REMARKS. EXPERIMENTAL HIGH-TEMPERATURE GAMMA-RAY PROBE.

STRATIGRAPHY BY QUEENSLAND MINES DEPT



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

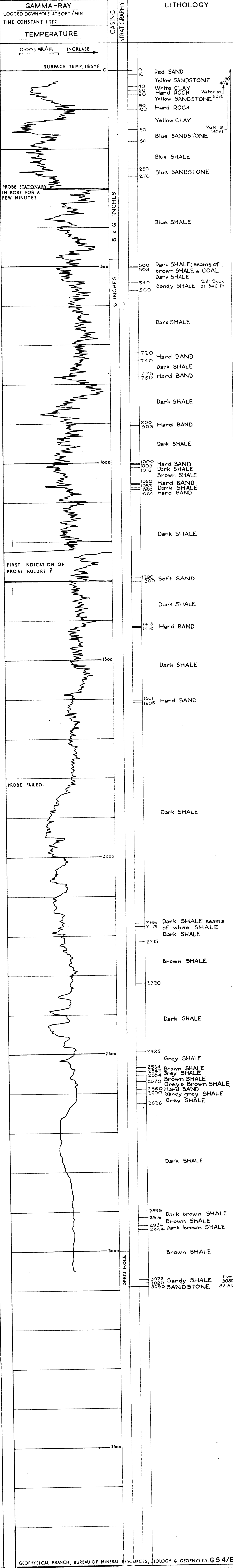
GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

ADRIA DOWNS.
(43)

IW.S.C. REGISTERED No.: 13088. COORDINATES: 26°00'S, 29.8 MILES NORTH.
OWNER: PRIVATE. 138°30'E, 30.6 MILES EAST.
DRILLED: 1957. ELEVATION: GROUND 235'
DEPTH, DRILLER: 3090' REF. LEVEL 235'
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER. LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE			24-8-61
FIRST READING			30
LAST READING			3050
FOOTAGE LOGGED			3020

REMARKS. EXPERIMENTAL HIGH-TEMPERATURE GAMMA-RAY PROBE.



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

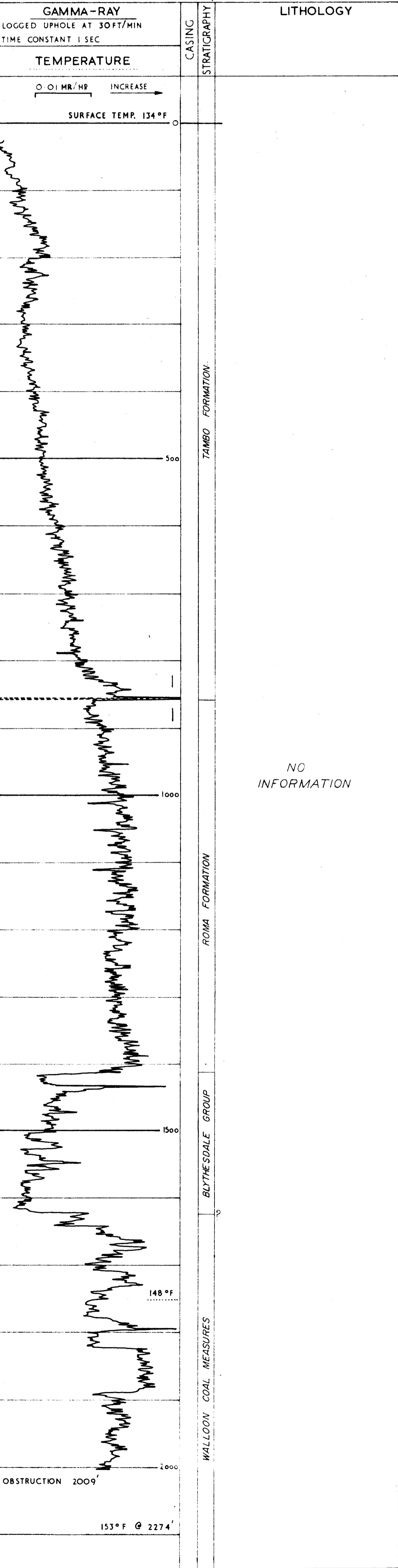
FULLERTON.
(44)

I.W.S.C. REGISTERED No.: 1450. COORDINATES: 23° 30'S, 10.6 MILES NORTH.
OWNER: PRIVATE. 144° 30'E, 14.5 MILES EAST.
DRILLED: 1898. ELEVATION: GROUND 804'.
DEPTH, DRILLER: 2320'. REF. LEVEL 804'.
BORE CONDITION: PUMPED, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER.
LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	
DATE	29-9-61		29-9-61	
FIRST READING	0		2002	
LAST READING	2281		26	
FOOTAGE LOGGED	2281		1976	

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.

STRATIGRAPHY BY CORRELATION



BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

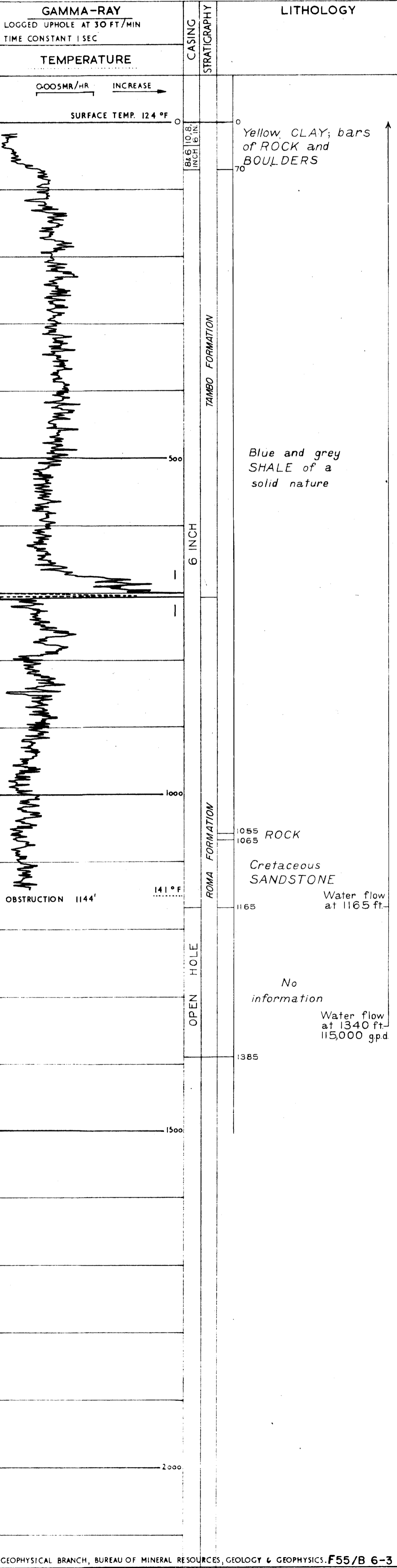
BALMORAL.
(45)

I.W.S.C. REGISTERED No.: 1456. COORDINATES: 23° 30'S, 16.7 MILES NORTH.
OWNER: PRIVATE. 144° 30'E, 6.1 MILES EAST.
DRILLED: 1913. ELEVATION: GROUND 707'.
DEPTH, DRILLER: 1385'. REF. LEVEL 707'.
BORE CONDITION: FLOWING, WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER.
LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	
DATE	27-9-61		27-9-61	
FIRST READING	0		1141	
LAST READING	1166		15	
FOOTAGE LOGGED	1166		1126	

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.

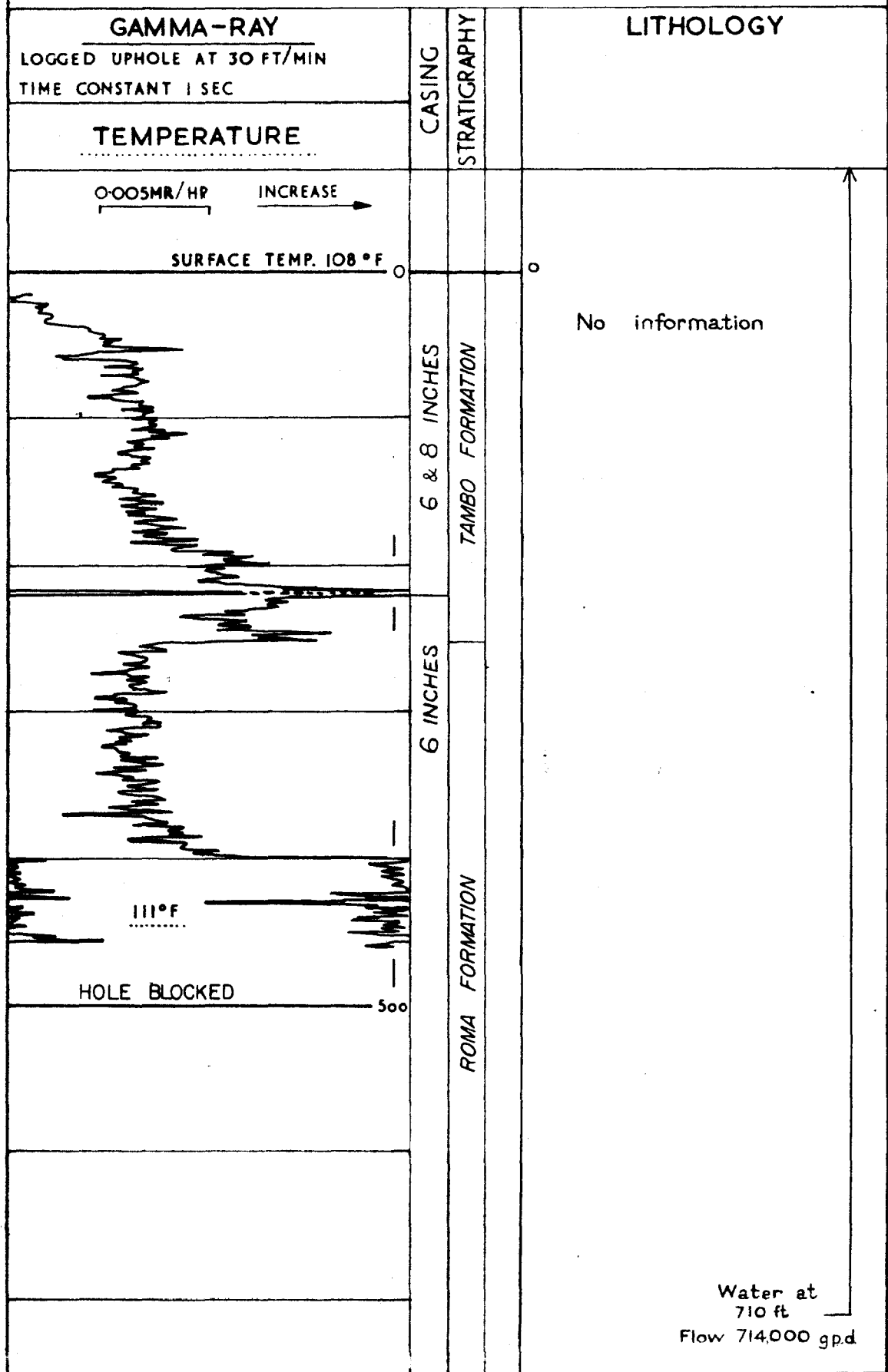
STRATIGRAPHY BY CORRELATION



SANDRINGHAM No. 4.
(46)

RUN	DUMMY	TEMPERATURE	GAMMA - RAY	
DATE	6 - 9 - 61		6 - 9 - 61	
FIRST READING	0		460	
LAST READING	461		15	
FOOTAGE LOGGED	461		445	

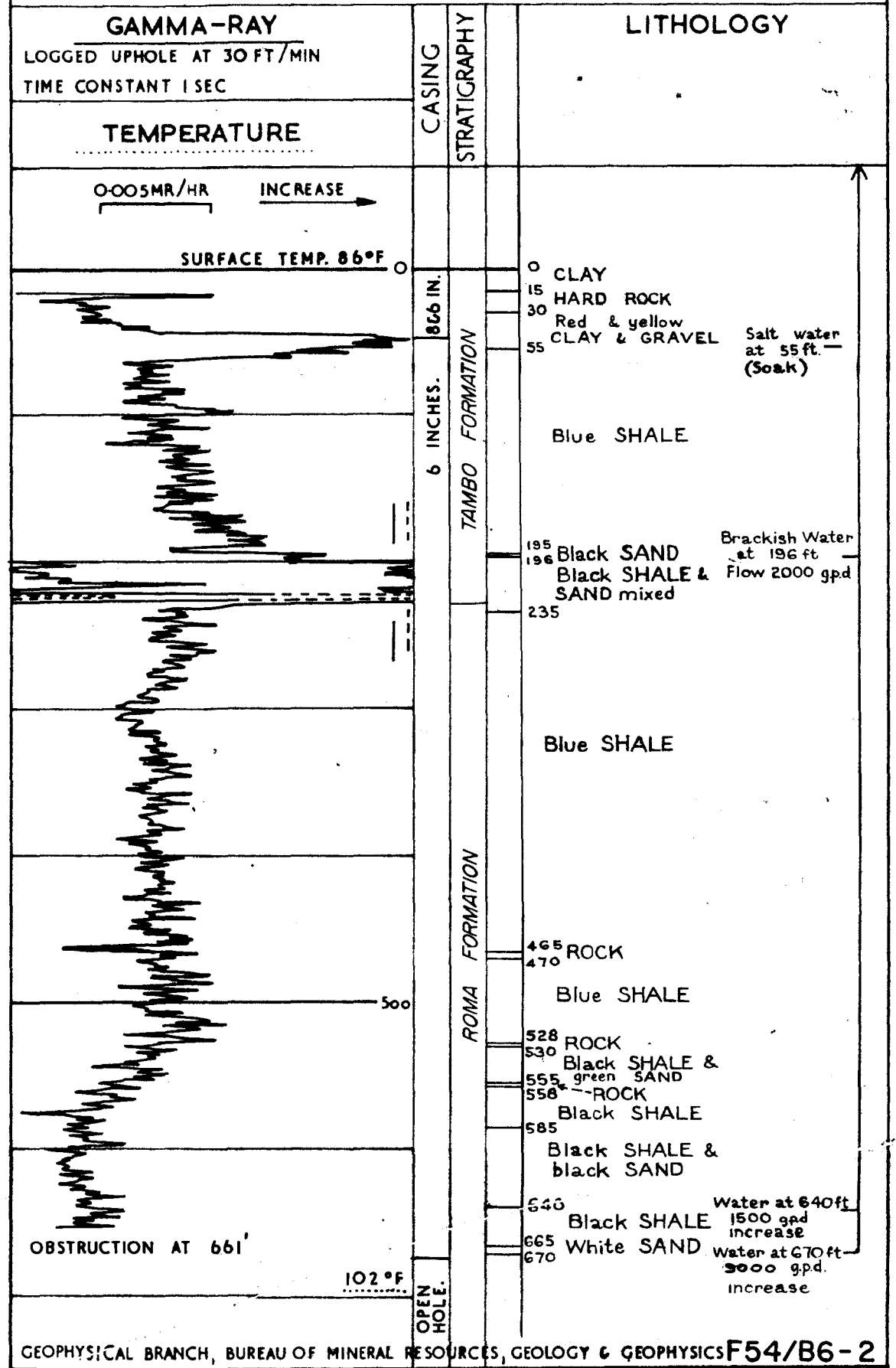
STRATIGRAPHY BY CORRELATION



BREADALBANE No. 9.
(47)

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	
DATE	5-9-61		5-9-61	
FIRST READING	0		657	
LAST READING	712		15	
FOOTAGE LOGGED	712		642	

STRATIGRAPHY BY CORRELATION



GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

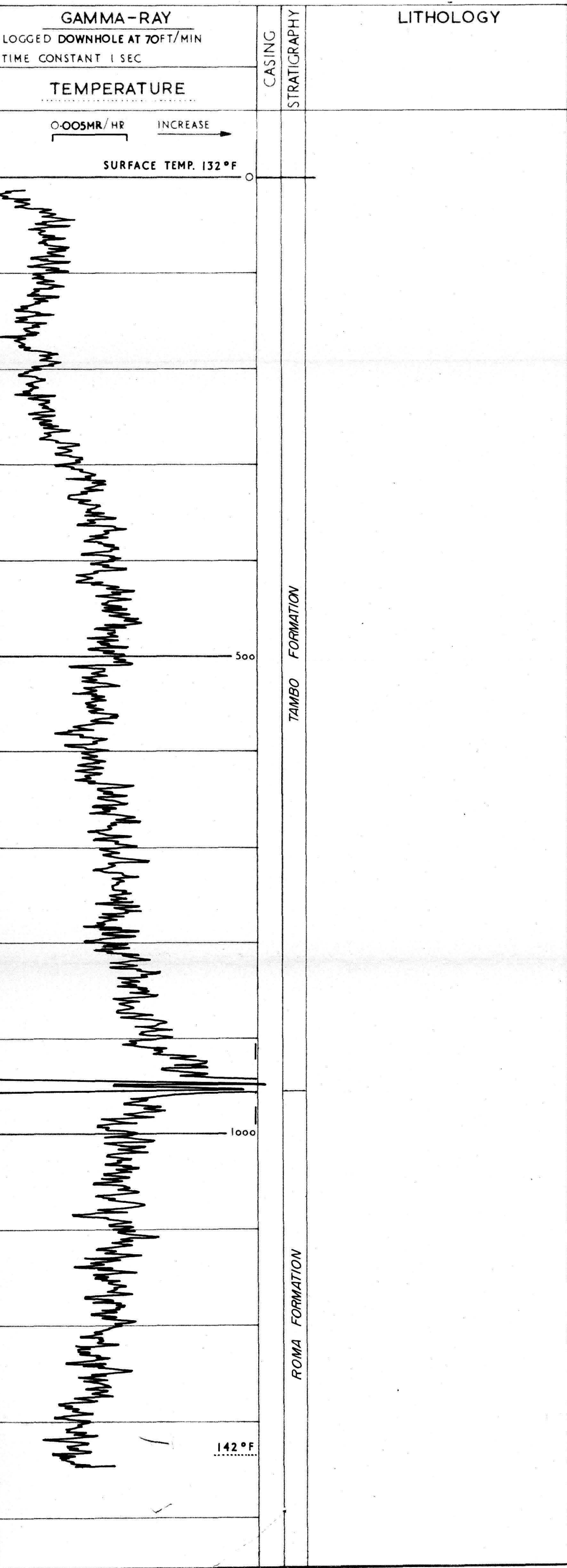
BORE No.II
(48)

I.W.S.C. REGISTERED No.: COORDINATES: 24° 30'S, 17.5 MILES NORTH,
OWNER: PRIVATE 140° 00'E, 7.8 MILES EAST.
DRILLED: ? ELEVATION: GROUND 362'
DEPTH, DRILLER: ? REF. LEVEL 362'
BORE CONDITION: FLOWING WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER.
LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	10-9-61		10-9-61
FIRST READING	0		134.6
LAST READING	1351		15
FOOTAGE LOGGED	1351		1331

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.

STRATIGRAPHY BY CORRELATION



GREAT ARTESIAN BASIN, QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

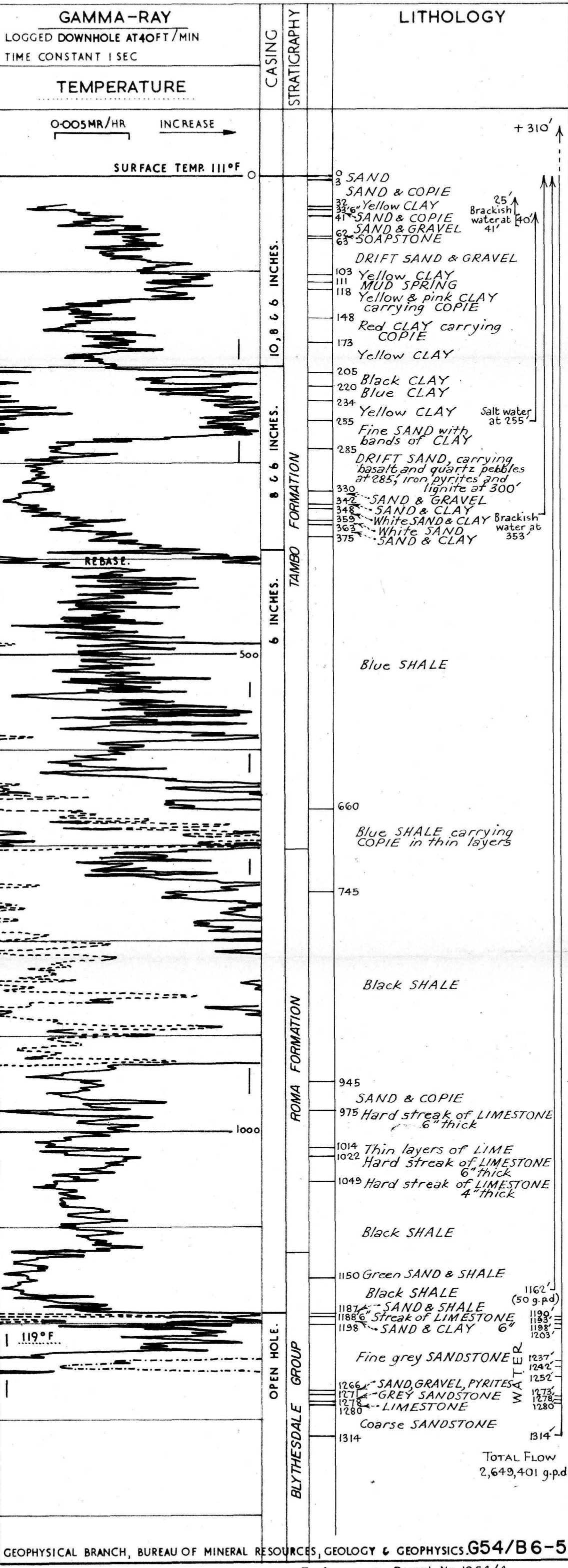
BEDOURIE No. 2.
(49)

I.W.S.C. REGISTERED No.: 316. COORDINATES: 24° 30'S, 8.9 MILES NORTH.
OWNER: TOWN. 139° 00'E, 29.8 MILES EAST.
DRILLED: 1905. ELEVATION: GROUND 300'
DEPTH, DRILLER: 1314' REF. LEVEL 307'
BORE CONDITION: FLOWING WATER. LOGGED BY: A. RADESKI.
LOGGING EQUIPMENT: FAILING LOGMASTER.
LITHOLOGY BY: DRILLER.

RUN	DUMMY	TEMPERATURE	GAMMA-RAY
DATE	29-8-61		29-8-61
FIRST READING	0		1251
LAST READING	1254		30
FOOTAGE LOGGED	1254		1221

REMARKS. DEPTHS CORRECTED FOR CABLE STRETCH.
LARGE FLUCTUATIONS OF THE GAMMA LOG MAY SUGGEST IT IS UNRELIABLE

STRATIGRAPHY BY CORRELATION



GREAT ARTESIAN BASIN, S.W. QUEENSLAND.
EXPERIMENTAL BORE LOGGING PROGRAMME 1961.

PHILLIPS-SUNRAY BUCKABIE No 1
(52)

I.W.S.C. REGISTERED No.:
OWNER: PHILLIPS PETROLEUM Co.
DRILLED: 1961
DEPTH, DRILLER: 9070'
MORE CONDITION: STANDING MUD
LOGGING EQUIPMENT: WELEX

COORDINATES: 26° 30' S, 20.9 MILES NORTH
144° 00' E, 16.5 MILES EAST.
ELEVATION: GROUND 724'
REF. LEVEL 738'
LOGGED BY: WELEX (A.C. BRACKE)

LITHOLOGY BY: OIL COMPANY

RUN	DUMMY	TEMPERATURE	GAMMA-RAY	
DATE			3-6-61	
FIRST READING			5678	
LAST READING			40	
FOOTAGE LOGGED			5638	

REMARKS: DEPTHS CORRECTED FOR CABLE STRETCH.
GEIGER DETECTOR

STRATIGRAPHY BY OIL COMPANY

GAMMA-RAY
LOGGED UPHOLE AT 30 FT/MIN
TIME CONSTANT 2 SEC

COUNTS/sec INCREASE
10 100 0

13 3/4 INCHES
WINTON FORMATION

SEE WELL COMPLETION REPORT
(PHILLIPS PETROLEUM Co. AND SUNRAY
MID CONTINENT OIL Co., 1962)

9 INCHES
ROMA AND TAMBO FORMATIONS
TAMBO FORMATION

1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000

Logging Speed 30 ft/min
Logging Speed 50 ft/min

BMR INTERPRETATION

ROMA FORMATION

ROMA FORMATION

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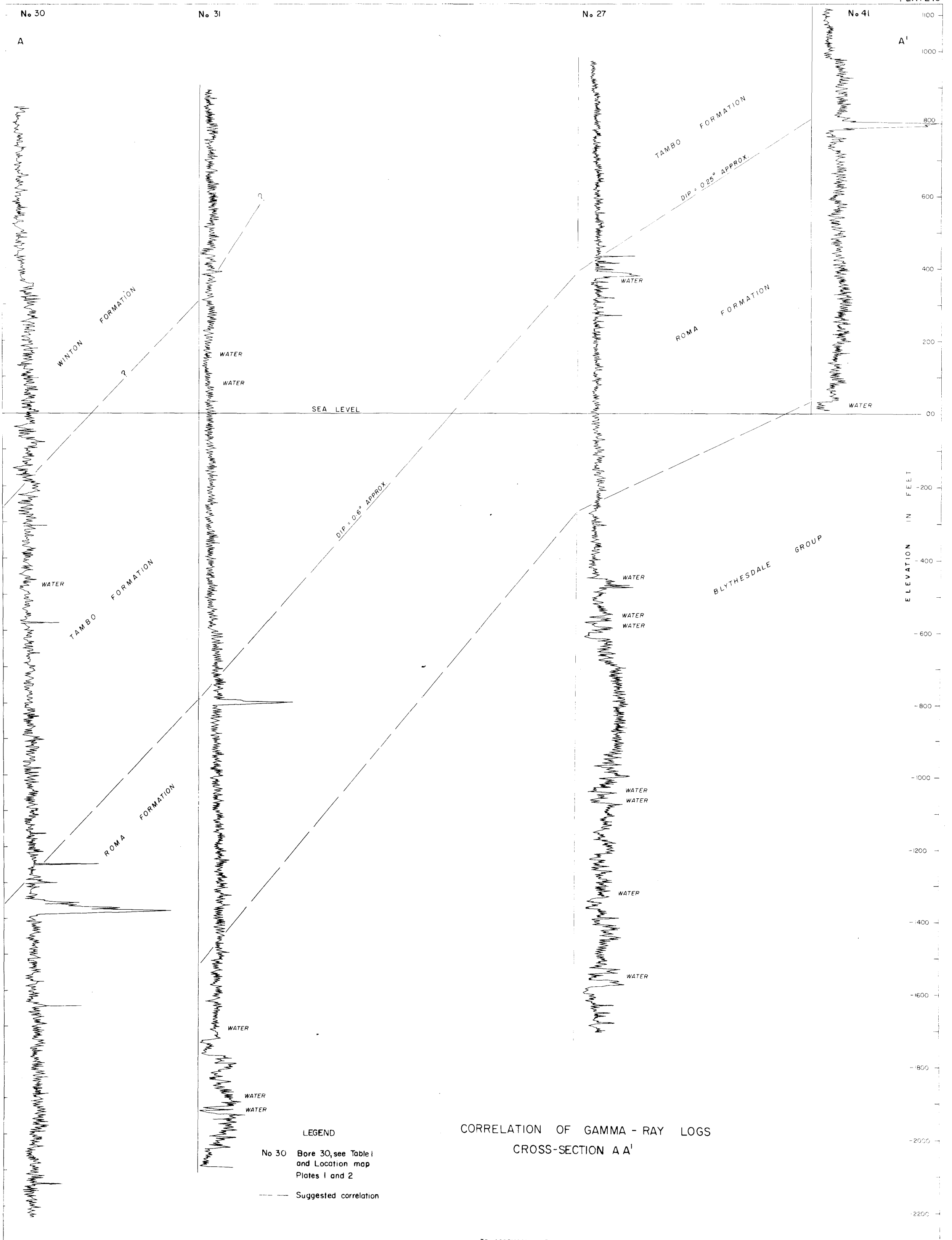
ROMA FORMATION

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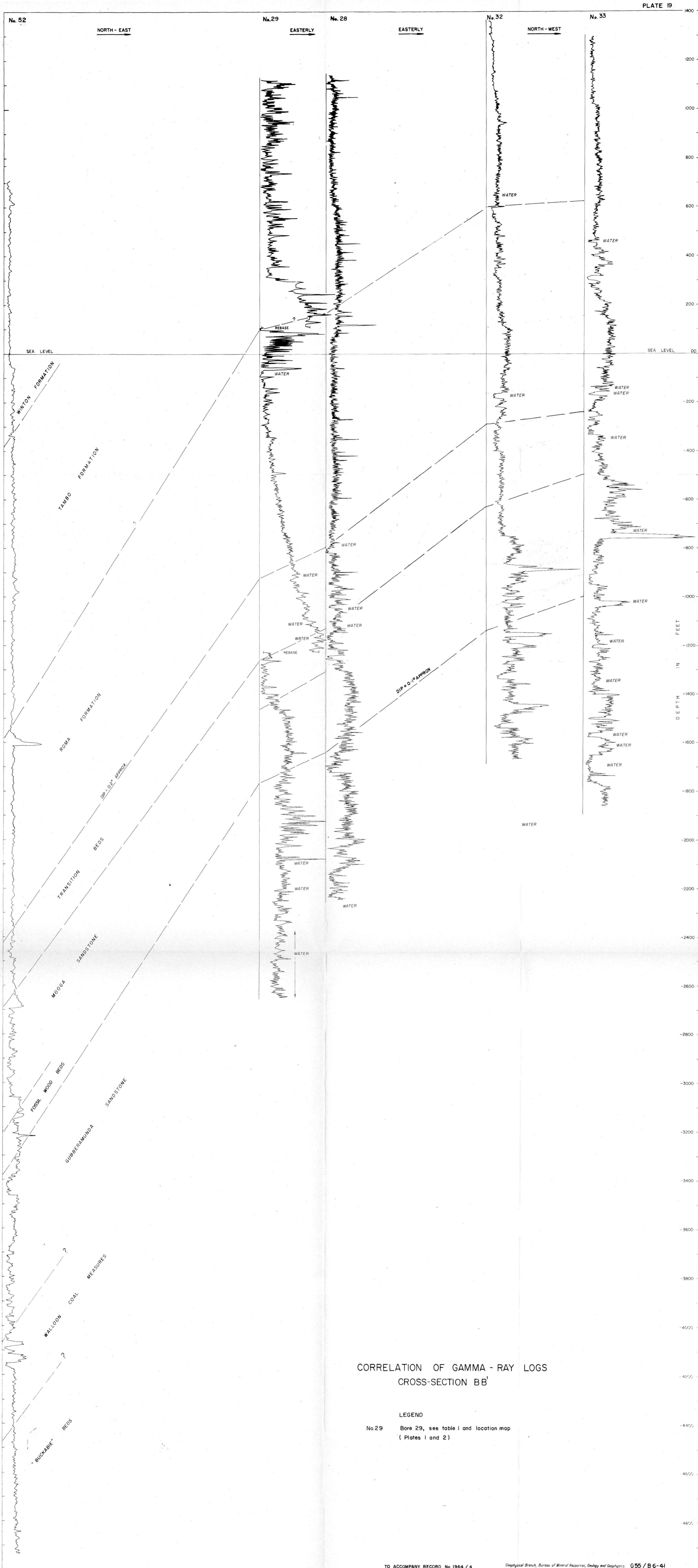


NORTH - EAST

EASTERLY

EASTERLY

NORTH - WEST



CORRELATION OF GAMMA - RAY LOGS CROSS-SECTION BB'

LEGEND

No. 29 Bore 29, see table 1 and location map
(Plates 1 and 2)