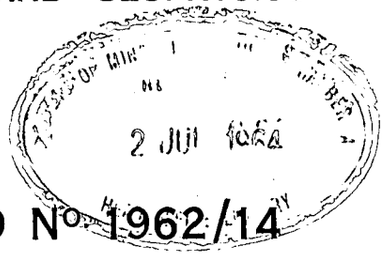
COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES.

GEOLOGY AND GEOPHYSICS



RECORD No. 1962/14

GREAT ARTESIAN BASIN

RECONNAISSANCE GRAVITY SURVEY USING HELICOPTERS.

QUEENSLAND 1961

by

G. F. LONSDALE

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CONTENTS

ILLUSTRATIONS

1. INTRODUCTION

During the period 16th August to 30th September a survey was conducted over a part of the Great Artesian Basin in south-western Queensland by the BMR Helicopter Gravity Party.

The surveyed area, shown on Plate 1, comprises the following 4-mile sheet areas: BEDOURIE, BIRDSVILLE, MACHATTIE, BETOOTA, CANTERBURY, CONNEMARA, and BRIGHTON DOWNS - a total of nearly 50,000 square miles.

Gravity readings were taken on an approximate 7 x 7 mile grid as part of the reconnaissance helicopter gravity coverage of the sedimentary basins of Australia.

Throughout this report the individual 4-mile sheet areas will be denoted by capital letters, e.g. BEDOURIE, whilst locations will be shown in small type, e.g. Bedourie.

2. GEOLOGY

The geology of the Great Artesian Basin has been discussed by A.J. Flavelle in the Preview Report for this survey and details will not be repeated here.

However, attention is drawn to the major features of interest included on Plate 2, compiled from BMR 4-mile geological maps and the 'Geological Map of Queensland' prepared jointly by the Geological Survey of Queensland and the University of Queensland.

The surface geology consists of Mesozoic, Tertiary, and Quaternary rocks generally showing little evidence of tectonic activity except gentle folding. These beds lie unconformably on Palaeozoic and Precambrian rocks showing more intense deformation. These latter rocks include both acid and basic intrusions. They crop out beyond the north-western margin of the survey area north and west of the BOULIA sheet where they form the exposed portion of the Boulia Shelf.

Two main geological units are present in the survey area: the Boulia Shelf and the Great Artesian Basin. The Boulia Shelf is known from bore-hole evidence to continue south-east beneath a thin Mesozoic cover into the surveyed area. These Mesozoic sediments are part of the Great Artesian Basin which increases considerably in thickness to the south and east beyond the margin of the Boulia Shelf.

A number of gentle NNE-trending anticlines have been mapped in the Mesozoic and Tertiary rocks of BETOOTA and CANTERBURY, including the elongate Betoota and Curalle Anticlines.

Where the Boulia Shelf is exposed, the dominant trend is north-west to north. From known geology this trend may be expected to continue into the survey area beneath the more recent sedimentary rocks. An important structure likely to follow this trend into the survey area is the Toko Syncline, whose position is shown on Plate 2.

3. HELICOPTER UTILISATION

Initially two helicopters were engaged on the survey, a Bell 47J and a Bristol Sycamore, both chartered from Ansett-ANA. On 4th September the Sycamore was wrecked at Glengyle, and as no replacement was available the party was reduced to single-helicopter operation during the remainder of the survey.

In a total of 66 helicopter days, 226 hours was flown, of which 166 hours was flown in the Bell helicopter. Included in the 66 helicopter days were a total of 15½ days unserviceability and two days lost because of bad weather. Over the remaining 48½ helicopter days there was an average of 4.7 hours flying per day.

4. GEOPHYSICAL SURVEY

The BEDOURIE, BIRDSVILLE, MACHATTIE, and BETOOTA sheets were flown from the base camp at Glengyle Homestead and from fly-camps established at Bedourie, Birdsville, Coorabulka No. 10 Bore, and Durrie Downs Homestead.

The remaining sheets - CANTERBURY, CONNEMARA, and BRIGHTON DOWNS - were flown from the base camp at Davenport Downs Homestead with fly-camps at South Galway, Currawilla and Brighton Downs Homesteads. These places are shown on Plate 3.

During the survey, 974 new stations were established. In addition, ties were made to 36 stations established during previous BMR surveys, including both road surveys in the area and helicopter surveys in the neighbouring areas of SIMPSON DESERT NORTH, MOUNT WHELAN, and SPRINGVALE. A further four stations read by Mines Administration Pty Ltd on the eastern margin of SIMPSON DESERT SOUTH were reoccupied. A gravity tie was also made to the BMR Pendulum Station at Birdsville.

5. GEOPHYSICAL EQUIPMENT AND PROCEDURE

Three gravity meters were used during the survey. World-wide 35 was used throughout the period, Worden 140 was used from the commencement of the survey until 2nd September and was then replaced by Worden 61. Six Askania microbarometers were used to determine the altitudes of the stations established. Normally only two (or three in the case of two-helicopter operations) microbarometers were used.

Regarding the use of these instruments in the field and the subsequent computations, the system used was that described in "Standard Helicopter Gravity Procedure" (Hastie - in preparation).

Bouguer anomalies based on a density of 1.9 g/cm^3 were calculated. These values were plotted on maps which were then contoured. Follow-up flights were planned where it was found necessary to investigate the anomaly pattern further.

6. RESULTS

Plates 4 to 10 show the Bouguer anomalies of the individual 4-mile areas. These maps are only preliminary; more accurate loop closure and plotting are necessary before the final contours can be drawn. Thus, at this stage, accurate contour ties have not been made to the maps of the surrounding areas.

Plate 3 shows the preliminary anomalies of the surveyed and surrounding areas drawn on a scale of 40 miles to the inch. Attention is drawn to the major features of interest revealed by the survey. These features are listed below, the feature numbers being shown on Plate 3.

Feature No.	Name of Feature	Description of Feature
1.	Toko Syncline	Deep 'low' in NE of BEDOURIE
2.		Sharp gradient flanking SW side of Feature 1.
3.		Uniform gradient from SW of BEDOURIE to NE of BRIGHTON DOWNS.
4.	Annandale Gravity Depression	Deep depression centred on Annandale.
5.		'High' fingering NW 45 miles W of Birdsville. Feature not closed owing to insufficient information.
6.		Similarly unclosed 'high' 25 miles W of Birdsville.
7.		Small 'low' 20 miles N of Birdsville
8.		Depression in NE of BETOOTA
9.	Betoota Anticline	NNE-elongated 'high' 6 miles SE of Betoota.
10.	Curalle Anticline	NE-elongated ridge NW of centre of CANTERBURY with a S-extending spur in the SW.
11.		NNW-trending gradient in SE of CANTERBURY.
12.		Suggested NW trend in contours in WINDORAH.
13.		Depression extending from the NE into the N of CONNEMARA.
14.		Depression extending from NE into the NE of CONNEMARA.
15.		Suggested NW trend in contours in NE of MANEROO.
16.		Depression noted in traverse along railway in SE of WINTON.

The Bouguer anomaly picture of the Boulia Shelf is characterized by a north-north-west-trending series of elongated gravity 'highs' and 'lows', and is in contrast to that of the deeper part of the Great Artesian Basin, farther south-east, which has lower anomalies with no such obvious trends.

The margin of the Boulia Shelf is well delineated by gravity feature No. 3 - a relatively steep gradient approximately following the -5 milligal contour from the north-eastern corner of BRIGHTON DOWNS to the south-western corner of BEDOURIE, indicating that the Shelf is separated from the deeper part of the Great Artesian Basin by a fairly steep and uniform slope, probably a monoclinal flexure.

North-west of feature 3, and following the north-north-westerly trend of the Boulia Shelf, a gravity 'low' (feature 1) indicates the position and south-western extent of the Toko Syncline. This is shown to have its minimum Bouguer anomaly value some 10 miles south of Sandringham Homestead and to terminate approximately 20 miles south-south-west of Bedourie.

The Toko Syncline is bounded by steep gravity gradients to the south-west (feature 2) and east, indicating that the Syncline has steep margins with some faulting. A fault in the position of feature 2 has been inferred from geological evidence as an extension of the Pulchera Fault in MOUNT WHELAN (Reynolds, Olgers, & Jauncey, 1961).

On earlier maps drawn on the basis of some road traverses, a depression joining two gravity 'lows', features 16 and 7, was suggested. The additional gravity information indicates that this feature is not continuous although gravity 'lows' 16, 13, 8, 7, and 4 follow the line of the suggested depression. The relation between features 16 and 13 is not known, owing to insufficient gravity coverage, but features 13, 8, 7, and 4 are separated by gravity saddles. Of these gravity 'lows', feature 4 - the Annadale Gravity Depression - has the minimum Bouguer anomaly value.

At Betoota a north-north-east elongated gravity high (feature 9) is associated with the Betoota Anticline. This gravity 'high' appears to swing north and later north-north-west to produce the saddle separating the two gravity 'lows', features 8 and 13.

The southward-extending gravity spur of feature 10 coincides with the Curalle Anticline. Farther north, the gravity feature develops into a north-east elongated ridge which continues into JUNDAH and suggests that the Curalle Anticline may be an extension of the Longreach Spur (shown on Plate 2).

West of Birdsville, two gravity 'high' features trending north-north-west (features 5 and 6) are also probably associated with areas of uplift and suggest a structurally high area farther south in PANDIE PANDIE. Feature 6 appears to swing north-east to form the gravity saddle separating the gravity 'lows', features 4 and 7. Feature 5 continues in a north-westerly direction towards SIMPSON DESERT SOUTH.

The north-westerly trend in the gravity anomaly contours south of feature 3 has been noted in features 5, 6, and 9. It is also apparent in feature 11 (a fairly steep gradient trending north-west in the south of CANTERBURY) and is suggested in features 12 and 15 (north-west-trending gradients in WINDORAH and MANEROO) which require confirmation by further gravity work. The north-westerly trend may be produced by horizontal density changes in the pre-Mesozoic basement or late Mesozoic-Quarternary rejuvenation of basement fault structures.

7. REFERENCES

FLAVELLE, A.J. 1960 Great Artesian Basin helicopter gravity survey 1961, Preview Report (unpubl.). BMR.

REYNOLDS, M.A., OLGERS, F, & JAUNCEY, W. 1961 Geology of the Bedourie, Machattie, Birdsville, and Betoota four-mile sheet areas in western Queensland. Bur. Min. Resour. Aust. Rec. 1961/54.

AUSTRALIA
4-MILE / 1:250,000 MAP SERIES

SCALE IN MILES

200 0 200 400

1961 HELICOPTER GRAVITY SURVEY
GREAT ARTESIAN BASIN, QLD.

NMP/59/151·1

G 295 - 55

TO ACCOMPANY RECORD No 1962/14

LEGEND

- QUATERNARY — Sandunes and alluvium
- Undifferentiated
- TL — Laterite
- Mainly basalt
- TERTIARY — CAINOZOIC
- ▲56 — BMR gravity pendulum station
- BOULIA — BMR 4 mile gravity map area
- Winton Formation (fresh water)
- Tambo Formation (marine)
- Roma Formation (marine)
- Blythesdale Group (sandstone)
- CRETACEOUS — MESOZOIC
- Railway
- Fault
- Anticlinal structure
- Upper Bowen coal measures
- Joe Joe Formation (glacials)
- PERMIAN
- ORDOVICIAN — Toko Group (marine)
- CAMBRIAN — Barkly Group (marine)
- PALAEOZOIC
- PRECAMBRIAN — Cloncurry Complex
- IGNEOUS ROCKS — Plutonic rocks mainly granite and granodiorite

COMPILED SEPTEMBER 1961
REVISED NOVEMBER 1961

GREAT ARTESIAN BASIN
S.W. QUEENSLAND
GEOLOGY

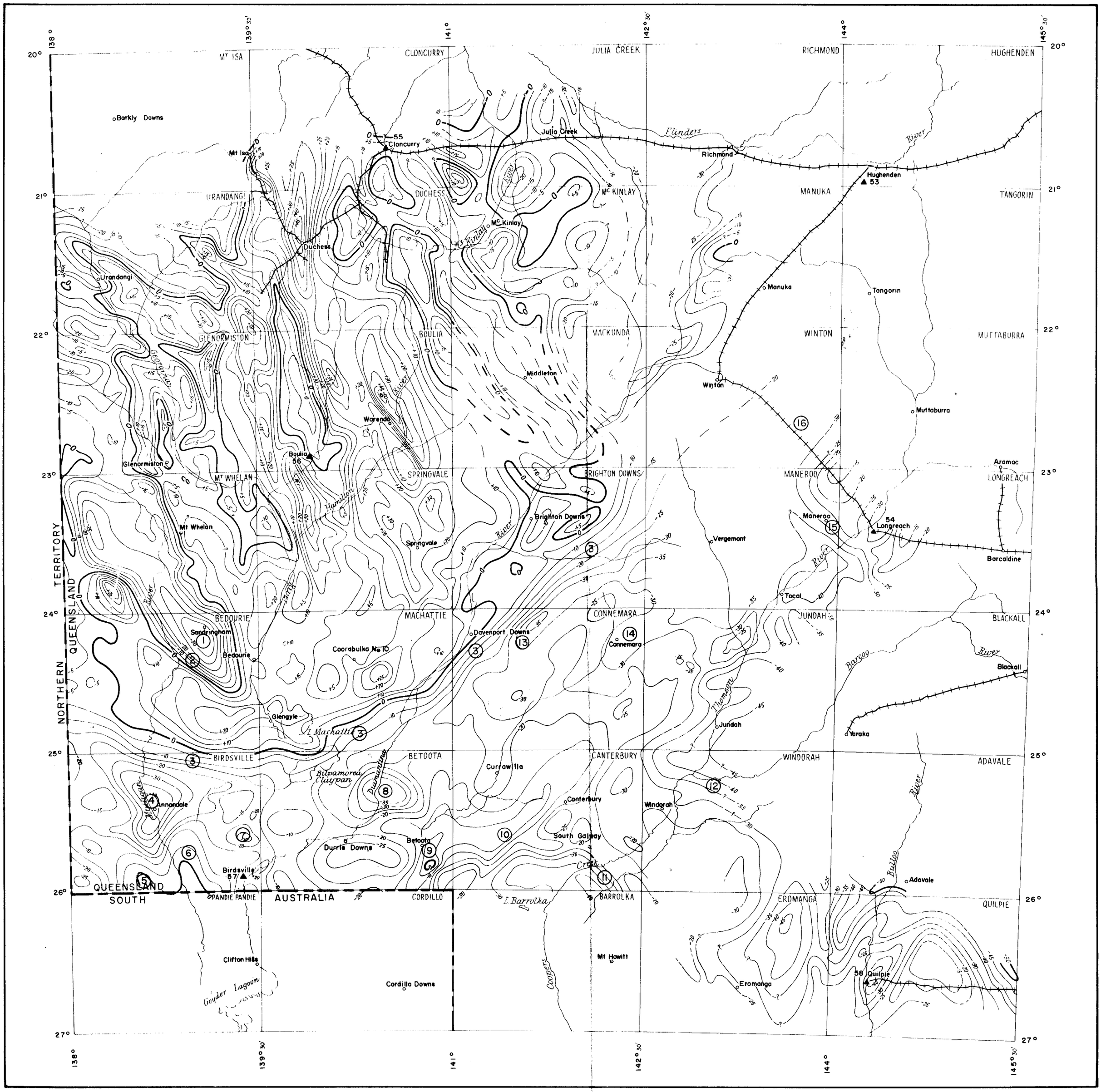
SCALE IN MILES

40 0 40 80 120

Reference - Division of National Mapping 40miles to 1inch topographic map.
Geology after BMR 4-mile maps and geological map of Queensland.

GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G 371-1-4

TO ACCOMPANY RECORD 1962/14



LEGEND

- Isogals, values in milligals
- Gravity 'high' anomaly
- Gravity 'low' anomaly
- ▲ 56 — BMR gravity pendulum station
- BOULIA — BMR 4 mile gravity map area
- Railway

COMPILED SEPTEMBER 1960
REVISED NOVEMBER 1961

RECONNAISSANCE GRAVITY SURVEY (1957-1961)
S W QUEENSLAND

BOUGUER ANOMALIES

SCALE IN MILES

40 0 40 80 120

Reference - Division of National Mapping 40 miles to 1 inch topographic map.
CONTOUR INTERVAL 5 MILLIGALS

GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G371-1-1

TO ACCOMPANY RECORD No 1962/14

AUSTRALIA 1:253,440

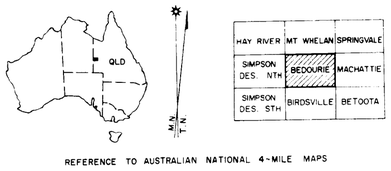
BEDOURIE
QUEENSLAND

G 54-1, ZONES 5 & 6

138°00' 139°30' 24°00' 25°00'

SANDRINGHAM STATION CK. BYRE CK. BEDOURIE INT. 10

LOCATION



HAY RIVER	MT WHELAN	SPRINGVALE
SIMPSON DES. NTH	BEDOURIE	MACHATTIE
SIMPSON DES. STH	BIRDSVILLE	BETOOTA

REFERENCE TO AUSTRALIAN NATIONAL 4-MILE MAPS

COMPILED FEBRUARY 1960
REVISED FEBRUARY 1962

MAP DATA

PROJECTION: TRANSVERSE MERCATOR, AUSTRALIAN SERIES

CONTROL: DEPT OF THE INTERIOR GRAVITY SURFACE CONTROL MAP WITH THE SAME NAME

DETAIL: DEPT OF THE INTERIOR GRAVITY SURFACE CONTROL MAP AND B M R GRAVITY FIELD SURVEY

RELIABILITY: PLANIMETRIC – SKETCH
GEOPHYSICAL – GRAVITY RECONNAISSANCE

RECONNAISSANCE GRAVITY SURVEY (1958)
GREAT ARTESIAN BASIN, QLD
BOUGUER ANOMALIES

SCALE IN MILES

4 0 4 8 12 16 20

HELICOPTER GRAVITY SURVEY 1961
SKETCH MAP ONLY

LEGEND

TOPOGRAPHY

ROAD
TRACK
WATERCOURSE (NON-PERENNIAL)
HOMESTEAD
ASTR STATION

GRAVITY

BMR STATION
" PERMANENT STN
-26·2 RELATIVE BOUGUER ANOMALIES (MILLIGALS)
172' ELEVATION
ISOGALS
'HIGH' ANOMALY
'LOW' ANOMALY

EXPLANATION

RELATIVE BOUGUER ANOMALIES ARE BASED ON THE OBSERVED GRAVITY VALUE OF 979,003·0 MILLIGALS AT B M R NR 57 PENDULUM STATION BIRDSVILLE, QLD.

FOR THE CALCULATION OF BOUGUER ANOMALIES 1·9 g/cm³ HAS BEEN ADOPTED AS AN AVERAGE ROCK DENSITY

ELEVATION DATUM – M.S.L., QUEENSLAND

NOTE: TOPOGRAPHY AND CULTURAL FEATURES SHOWN ONLY TO LOCATE GEOPHYSICAL DATA

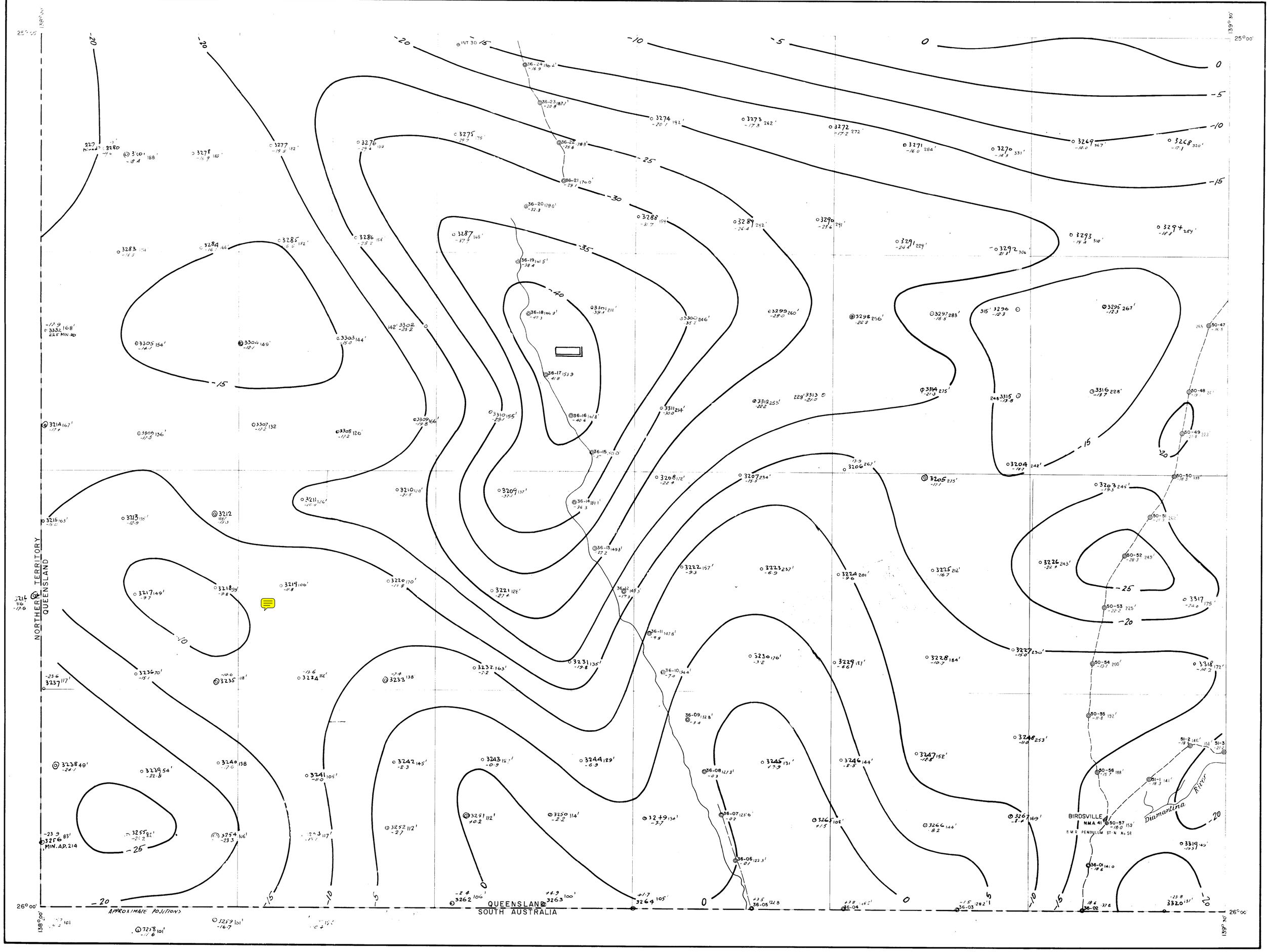
GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G69-62-2

TO ACCOMPANY RECORD No. 1962/14

AUSTRALIA 1:253,440

BIRDSVILLE
QUEENSLAND

G 54-5, ZONES 6 AND 7



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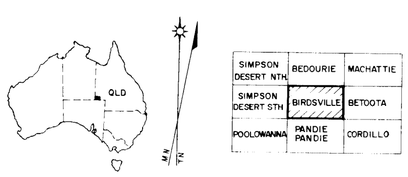


REFERENCE TO AUSTRALIAN NATIONAL 4-MILE MAP SERIES

COMPILED FEBRUARY 1960
REVISED FEBRUARY 1962

MAP DATA

PROJECTION: TRANSVERSE MERCATOR, AUSTRALIAN SERIES.

CONTROL: DEPT OF THE INTERIOR SURFACE CONTROL MAP WITH THE SAME NAME.

DETAIL: DEPT OF THE INTERIOR SURFACE CONTROL MAP AND BMR GRAVITY FIELD SURVEY.

RELIABILITY: PLANIMETRIC – SKETCH
GEOPHYSICAL – GRAVITY RECONNAISSANCE

RECONNAISSANCE GRAVITY SURVEY (1958)
GREAT ARTESIAN BASIN, QLD
BOUGUER ANOMALIES

SCALE IN MILES

4 0 4 8 12 16

HELICOPTER GRAVITY SURVEY 1961

SKETCH MAP ONLY

LEGEND

TOPOGRAPHY

- TRACK
- TOWNSHIP
- ASTRONOMICAL FIXATION
- WATERCOURSE (NON-PERENNIAL)

GRAVITY

- BMR STATION, PERMANENT ST-N
- RELATIVE BOUGUER ANOMALY (MILLIGALS)
- 197' ELEVATION
- ISOGALS
- 'HIGH' ANOMALY
- 'LOW' ANOMALY

EXPLANATION

RELATIVE BOUGUER ANOMALIES ARE BASED ON THE OBSERVED GRAVITY VALUE OF 979,003·0 MILLIGALS AT BMR Nº 57 PENDULUM STATION, BIRDSVILLE, QUEENSLAND.

FOR THE CALCULATION OF BOUGUER ANOMALIES 1·9 g/cm^3 HAS BEEN ADOPTED AS AN AVERAGE ROCK DENSITY.

ELEVATION DATUM – M.S.L. QUEENSLAND

NOTE TOPOGRAPHY AND CULTURAL FEATURES SHOWN ONLY TO LOCATE GEOPHYSICAL DATA.

GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G69-61-2

TO ACCOMPANY RECORD No 1962/14

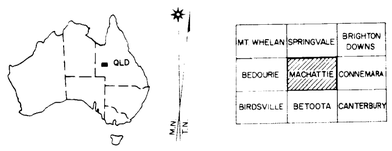
AUSTRALIA 1:253,440

MACHATTIE
QUEENSLAND

G54-2, ZONE 6

139°30' 141°00' 24°00' 25°00'

LOCATION



REFERENCE TO AUSTRALIAN NATIONAL 4-MILE MAPS

COMPILED FEBRUARY 1960
REVISED DECEMBER 1961

MAP DATA

PROJECTION: TRANSVERSE MERCATOR, AUSTRALIAN SERIES

CONTROL: DEPT. OF THE INTERIOR GRAVITY SURFACE CONTROL MAP WITH THE SAME NAME.

DETAIL: DEPT. OF THE INTERIOR GRAVITY SURFACE CONTROL MAP AND B.M.R. GRAVITY FIELD SURVEY.

RELIABILITY: PLANIMETRIC — SKETCH
GEOPHYSICAL — GRAVITY RECONNAISSANCE

RECONNAISSANCE GRAVITY SURVEY (1958)
GREAT ARTESIAN BASIN, QLD
BOUGUER ANOMALIES

SCALE IN MILES

4 0 4 8 12 16 20

HELICOPTER GRAVITY SURVEY 1961
SKETCH MAP ONLY

LEGEND

TOPOGRAPHY

ROAD
TRACK
WATERCOURSE (NON-PERENNIAL)
HOMESTEAD
ASTR STATION

GRAVITY

B.M.R. STATION
B.M.R. PERMANENT ST-M
RELATIVE BOUGUER ANOMALIES (MILLIGALS)
ELEVATION
ISOGALS
HIGH ANOMALY
LOW ANOMALY

EXPLANATION

RELATIVE BOUGUER ANOMALIES ARE BASED ON THE OBSERVED GRAVITY VALUE OF 979,093.5 MILLIGALS AT B.M.R. NP.57 PENDULUM STATION, BIRDSVILLE, QLD.

FOR THE CALCULATION OF BOUGUER ANOMALIES 1·9 g/cm³ HAS BEEN ADOPTED AS AN AVERAGE ROCK DENSITY.

ELEVATION DATUM — M.S.L., QUEENSLAND.

NOTE: TOPOGRAPHY AND CULTURAL FEATURES SHOWN ONLY TO LOCATE GEOPHYSICAL DATA.

GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G69-64-2

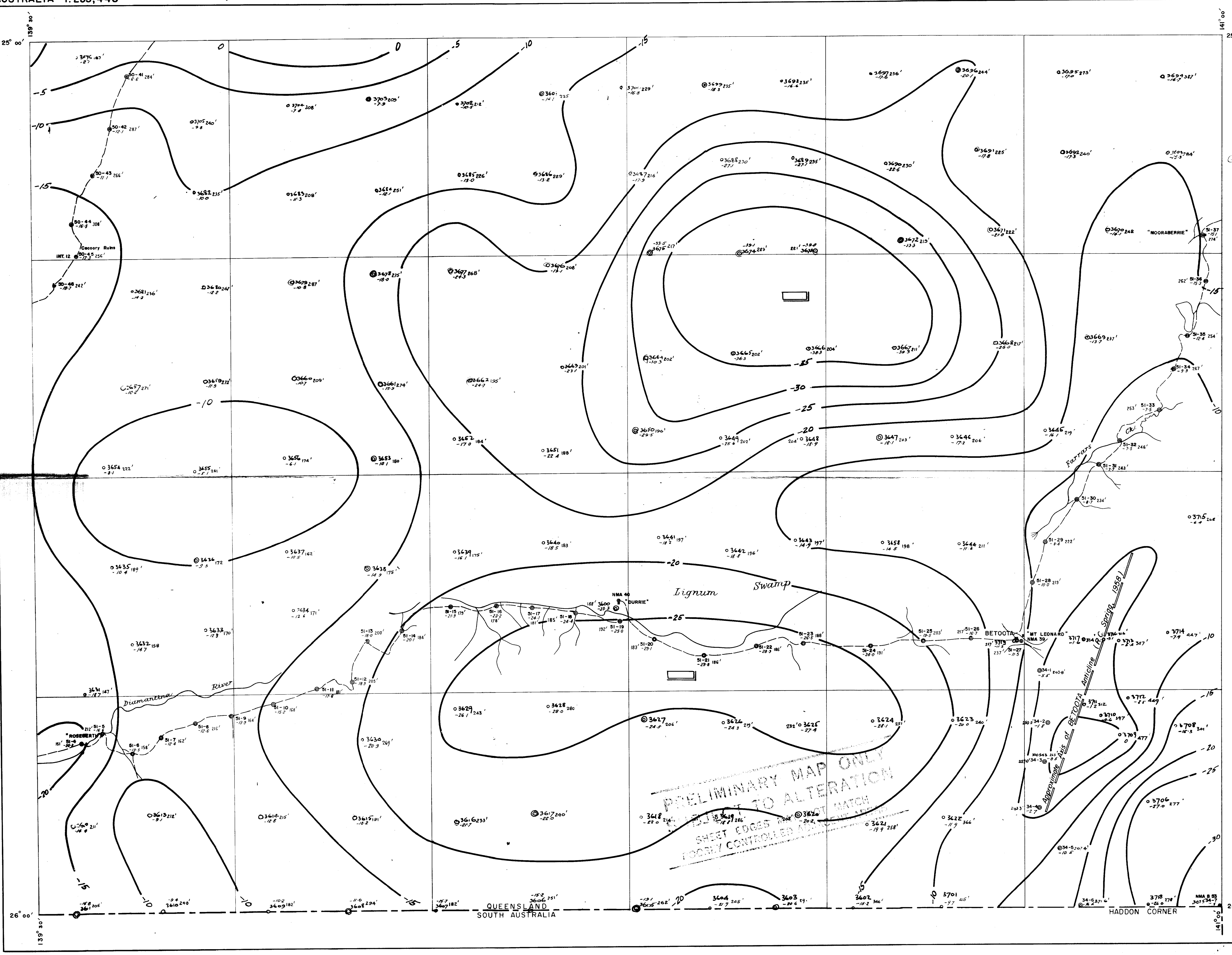
TO ACCOMPANY RECORD No. 1962/19

BETOOTA

QUEENSLAND

AUSTRALIA 1:253,440

G 54-6, ZONE 6



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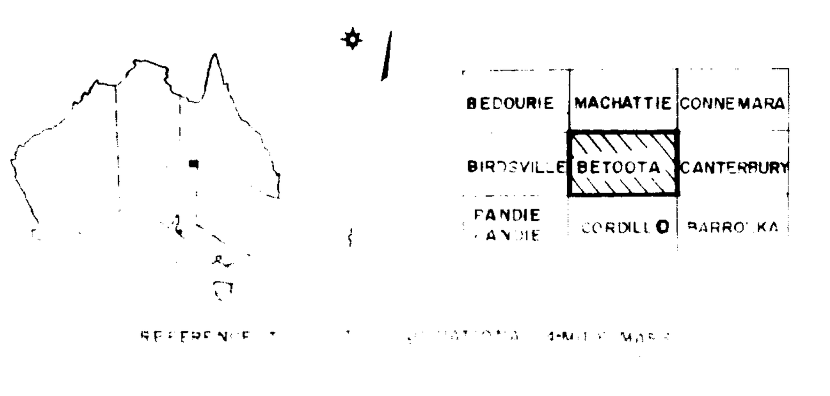


BEDOURIE	MACHATTIE	CONNEMARA
BIRDSVILLE	BETOOTA	CANTERBURY
FANDIE	CORDILLO	BARROLKA

COMPILED

REVISED FEBRUARY 1962

MAP DATA

PROJECTION: TRANSVERSE MERCATOR, AUSTRALIAN SERIES

CONTROL: DEPT OF THE INTERIOR GRAVITY SURFACE CONTROL MAP WITH THE SAME NAME

DETAIL: DEPT OF THE INTERIOR GRAVITY SURFACE CONTROL MAP AND B.M.R. GRAVITY FIELD SURVEY

RELIABILITY: PLANIMETRIC - SKETCH
GEOPHYSICAL - GRAVITY RECONNAISSANCE

RECONNAISSANCE GRAVITY SURVEY (1958)
GREAT ARTESIAN BASIN, QLD

BOUGUER ANOMALIES

SCALE IN MILES

4 0 4 8 12 16

HELICOPTER GRAVITY SURVEY 1961

SKETCH MAP ONLY

LEGEND

TOPOGRAPHY

- TRACK
- WATERCOURSE (NON-PERENNIAL)
- ASTRONOMICAL FIXATION
- HOMESTEAD

GRAVITY AND GEOLOGY

- BMR STATION
- " PERMANENT ST-N
- ISOGALS
- -16·7 RELATIVE BOUGUER ANOMALIES (MILLIGALS)
- 'HIGH' ANOMALY
- 217′ ELEVATION
- 'LOW' "
- FORM-LINES AT 100 FT INTERVALS BASED ON BASAL TERTIARY PHANTOM HORIZON (H WOPFNER AND BRUNNSCHWEILER, 1958)

EXPLANATION

RELATIVE BOUGUER ANOMALIES ARE BASED ON THE OBSERVED GRAVITY VALUE OF 979,003·0 MILLIGALS AT B.M.R No 57 PENDULUM STATION, BIRDSVILLE, QLD.

FOR THE CALCULATION OF BOUGUER ANOMALIES 1·9 g/cm^3 HAS BEEN ADOPTED AS AN AVERAGE ROCK-DENSITY.

ELEVATION DATUM - M.S.L., QUEENSLAND.

NOTE TOPOGRAPHY AND CULTURAL FEATURES SHOWN ONLY TO LOCATE GEOPHYSICAL DATA.

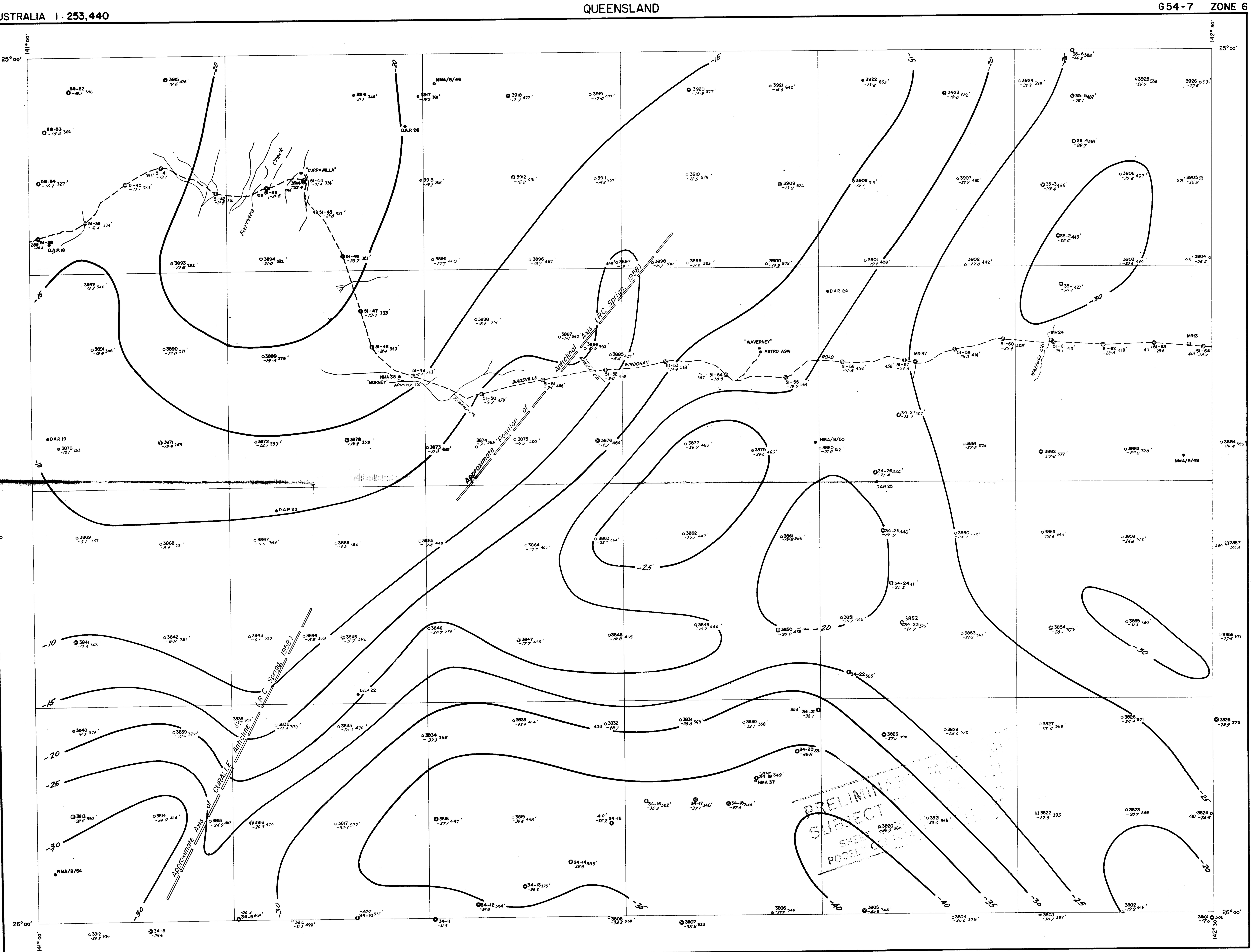
GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G 69-60-2
TO ACCOMPANY RECORD No 1962/14

PLATE 8

CANTERBURY
QUEENSLAND

AUSTRALIA 1 : 253,440

G54-7 ZONE 6



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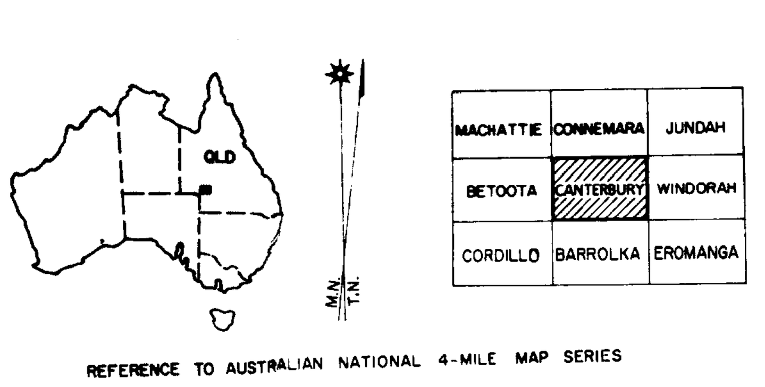


REFERENCE TO AUSTRALIAN NATIONAL 4-MILE MAP SERIES

COMPILED JANUARY 1960
REVISED FEBRUARY 1962

MAP DATA

PROJECTION: *TRANSVERSE MERCATOR, AUSTRALIAN SERIES.*

CONTROL: *DEPT OF THE INTERIOR 4-MILE GRAVITY SURFACE CONTROL MAP WITH THE SAME NAME.*

DETAIL: *B M R GRAVITY TRAVERSES FROM GRAVITY SURFACE CONTROL MAP. HELICOPTER SURVEY 1961 FROM G69-50-1*

RELIABILITY: *PLANIMETRIC – SKETCH*
GEOPHYSICAL – GRAVITY RECONNAISSANCE

RECONNAISSANCE GRAVITY SURVEY 1959-1961
GREAT ARTESIAN BASIN, QLD
PRELIMINARY BOUGUER ANOMALIES

SCALE IN MILES

4 0 4 8 12 16 20

CONTOUR INTERVAL 1 MILLIGAL

LEGEND

TOPOGRAPHY

- TRACK
- HOMESTEAD
- WATERCOURSE (NON - PERENNIAL)
- ASTR. STATION

GRAVITY AND GEOLOGY

- B M R STATION
- " " PERMANENT MARKED
- -21·7 RELATIVE BOUGUER ANOMALY (MILLIGALS)
- 413' ELEVATION (ABOVE M.S.L.)
- ISOGALS
- 'HIGH' ANOMALY
- 'LOW' ANOMALY
- FORM-LINES AT 100 FT INTERVALS BASED ON BASAL TERTIARY PHANTOM HORIZON (H WOPFNER AND BRUNNSCHWEILER, 1958)

EXPLANATION

RELATIVE BOUGUER ANOMALIES ARE BASED ON THE OBSERVED GRAVITY VALUES OF FOLLOWING B M R PENDULUM STATIONS:

Nº 57 BIRDSVILLE ....979,003·0 MILLIGALS
Nº 58 QUILPIE ....979,006·5 MILLIGALS

FOR THE CALCULATION OF BOUGUER ANOMALIES 1·9 g/cm³ HAS BEEN ADOPTED AS AN AVERAGE ROCK DENSITY.

NOTE: TOPOGRAPHY AND CULTURAL FEATURES SHOWN ONLY TO LOCATE GEOPHYSICAL DATA.

GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G69-50-2

TO ACCOMPANY RECORD 1962/14

AUSTRALIA 1:253,440

CONNEMARA
QUEENSLAND

G 54-3, ZONE 6

141° 00'

24° 00'

142° 30'

25° 00'

Diamantina River

"DAVENPORT DOWNS" INT 19

NMA B 52 · NMA B 58 · NMA B 57 · NMA B 51 · NMA B 59 · NMA B 60 · NMA B 45

LOCATION

SPRINGVALE	BRIGHTON DOWNS	MANEROO
MACHATTIE	CONNEMARA	JUNDAH
BETOOTA	CANTERBURY	WINDORAH

REFERENCE TO AUSTRALIAN NATIONAL 4-MILE MAP SERIES

COMPILED JUNE 1960
REVISED FEBRUARY 1962

MAP DATA

PROJECTION: TRANSVERSE MERCATOR, AUSTRALIAN SERIES.

CONTROL: DEPT OF THE INTERIOR 4-MILE GRAVITY SURFACE CONTROL MAP WITH THE SAME NAME.

DETAIL: B.M.R. GRAVITY TRAVERSES FROM GRAVITY SURFACE CONTROL MAP. HELICOPTER SURVEY 1961 FROM G69-65-1

RELIABILITY: PLANIMETRIC — SKETCH.
GEOPHYSICAL — GRAVITY RECONNAISSANCE.

RECONNAISSANCE GRAVITY SURVEY 1959-1961
GREAT ARTESIAN BASIN, QLD
PRELIMINARY BOUGUER ANOMALIES

SCALE IN MILES

4 0 4 8 12 16

CONTOUR INTERVAL 1 MILLIGAL

LEGEND

TOPOGRAPHY

- TRACK
- HOMESTEAD
- WATERCOURSE (NON-PERENNIAL)
- ASTRONOMICAL FIXATION

GRAVITY

- B.M.R. STATION
- PERMANENT MARKED
- +1·8 RELATIVE BOUGUER ANOMALY (MILLIGALS)
- 321' ELEVATION
- ISOGALS
- 'HIGH' ANOMALY
- 'LOW' ANOMALY

EXPLANATION

RELATIVE BOUGUER ANOMALIES ARE BASED ON THE OBSERVED GRAVITY VALUES OF THE FOLLOWING B.M.R. PENDULUM STATIONS, QUEENSLAND.

N° 56 BOULIA ..... 979,793·2 MILLIGALS
N° 57 BIRDSVILLE ..... 979,003·0 MILLIGALS

FOR THE CALCULATION OF BOUGUER ANOMALIES 1·9 g/cm^3 HAS BEEN ADOPTED AS AN AVERAGE ROCK DENSITY.

ELEVATION DATUM — M.S.L. QUEENSLAND.

NOTE: TOPOGRAPHY AND CULTURAL FEATURES SHOWN ONLY TO LOCATE GEOPHYSICAL DATA.

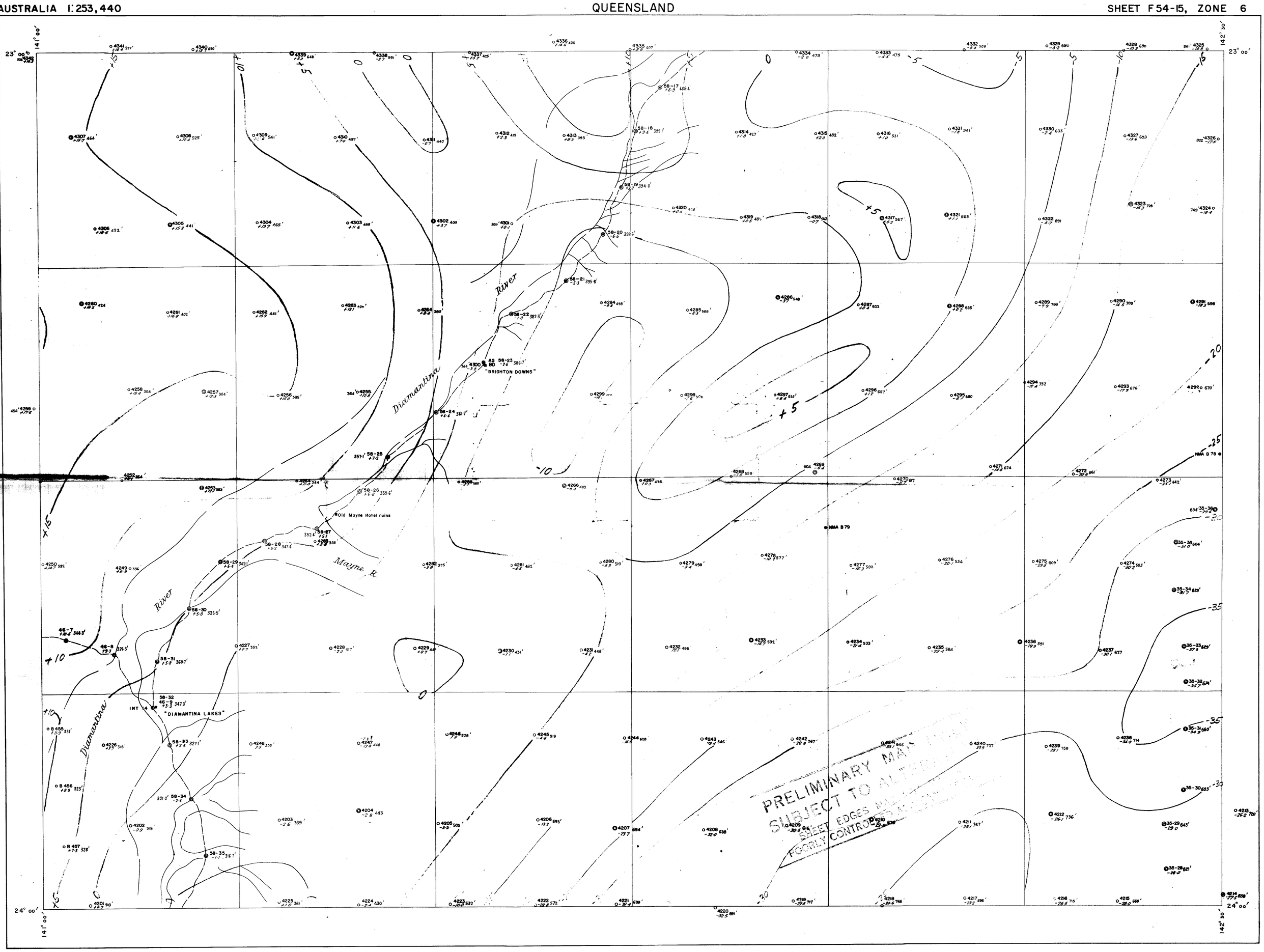
GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G 69-65-2

TO ACCOMPANY RECORD 1962 / 14

PLATE 10

BRIGHTON DOWNS

AUSTRALIA 1:253,440 — QUEENSLAND — SHEET F 54-15, ZONE 6



LOCATION

BOULIA	MACKUNDA	WINTON
SPRINGVALE	BRIGHTON DOWNS	MANEROO
MACHATTIE	CONNEMARA	JUNDAH

REFERENCE TO AUSTRALIAN NATIONAL 4-MILE MAPS

COMPILED FEBRUARY 1960
REVISED FEBRUARY 1962

MAP DATA

PROJECTION: TRANSVERSE MERCATOR, AUSTRALIAN SERIES

CONTROL: DEPT OF THE INTERIOR GRAVITY SURFACE CONTROL MAP WITH THE SAME NAME AND N. W. PHOTOCENTRE COMPILATION

DETAIL: DEPT OF THE INTERIOR GRAVITY SURFACE CONTROL MAP, B.M.R. GRAVITY FIELD SURVEY AND 1961 HELICOPTER GRAVITY SURVEY

RELIABILITY: PLANIMETRIC - SKETCH
GEOPHYSICAL - GRAVITY RECONNAISSANCE

RECONNAISSANCE GRAVITY SURVEY (1958-61)
GREAT ARTESIAN BASIN, QLD
BOUGUER ANOMALIES

SCALE IN MILES

4 0 4 8 12 16

CONTOUR INTERVAL 1 MILLIGAL

LEGEND

TOPOGRAPHY

- TRACK
- WATERCOURSE (NON-PERENNIAL)
- ASTRONOMICAL FIXATION
- HOMESTEAD

GRAVITY

- B.M.R. STATION (PERMANENT MARK)
- RELATIVE BOUGUER ANOMALIES (MILLIGALS)
- ISOGALS
- 'HIGH' ANOMALY
- 'LOW' "
- ELEVATION

EXPLANATION

RELATIVE BOUGUER ANOMALIES ARE BASED ON THE OBSERVED GRAVITY VALUE OF 978,789·8 MILLIGALS AT B.M.R. No.54 PENDULUM STATION, LONGREACH, QLD.

FOR THE CALCULATION OF BOUGUER ANOMALIES 1·9 HAS BEEN ADOPTED AS AN AVERAGE ROCK DENSITY.

ELEVATION DATUM - M.S.L., QUEENSLAND.

NOTE: TOPOGRAPHY AND CULTURAL FEATURES SHOWN ONLY TO LOCATE GEOPHYSICAL DATA.

GEOPHYSICAL BRANCH, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS G69-58-3
TO ACCOMPANY RECORD No. 1962/14