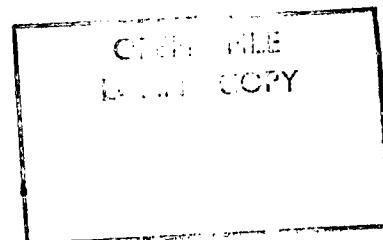


COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS



RECORD No. 1962/47



REGIONAL GRAVITY TRAVERSE QUILPIE TO ROMA, QUEENSLAND 1960

by

W.J. Langron

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 It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and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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ILLUSTRATIONS

Plate 1. Plan showing station locations, elevations, and Bouguer values (G38-104).

SUMMARY

A regional gravity traverse connecting Quilpie and Roma pendulum stations shows a difference about 1 milligal greater than the pendulum measurements. The results are not interpreted in detail, but low gravity values generally correspond to thicker sediments.

1. INTRODUCTION

During October 1960, a gravity traverse was read between the Quilpie and Roma pendulum stations, Queensland. The field work was done by S. Waterlander. Most of the readings between Quilpie and Charleville were made at private company seismic shot-holes. (Phillips Petroleum Company and Sunray-Mid-Continent Oil Company). Not all the stations read are shown on the accompanying Plate 1; however, all of them, together with several other seismic traverses which were read with gravity meter in the Quilpie area will be included in a report by Reid (in preparation).

A World Wide gravity meter (S/No. 35) was used for the work. Its sensitivity is 0.11295 mgal per scale division. The revised values for pendulum stations (Dooley, in preparation) have been used in the present discussion and the results also incorporate the revised sensitivity for the instrument. Before and after the survey, a check of the instrument sensitivity was made on the Brisbane calibration range.

2. DISCUSSION OF RESULTS

The field readings have been reduced to Bouguer anomaly values using the crustal density figure of 2.67 g/cm^3 . Elevations of the seismic shot-holes, which were generally alongside the railway line, were obtained from Phillips Petroleum Company. Most of the remaining gravity readings were taken at Main Roads Department Bench marks along the Charleville to Roma road.

Plate 1 shows the locations of the stations together with the Bouguer anomaly value and elevation of each station. The main purpose of this account is to place the results of this pendulum tie on record for their later incorporation in the gravity map of Australia. It is not proposed to attempt a detailed interpretation of the results, but comparison with the seismic results suggests that the gravity 'lows' are associated with increasing thickness of sediments. This seems to be a general relation in the Great Artesian Basin, over which the major portion of this traverse lies. The Nebine Ridge, which separates the Great Artesian Basin in the west from the Surat and Bowen Basins to the east, is approximately 65 miles east of Charleville, but its position is not clearly indicated by the gravity results. The small gravity 'high' about stations 4-62 and 4-63 could, however be associated with this feature.

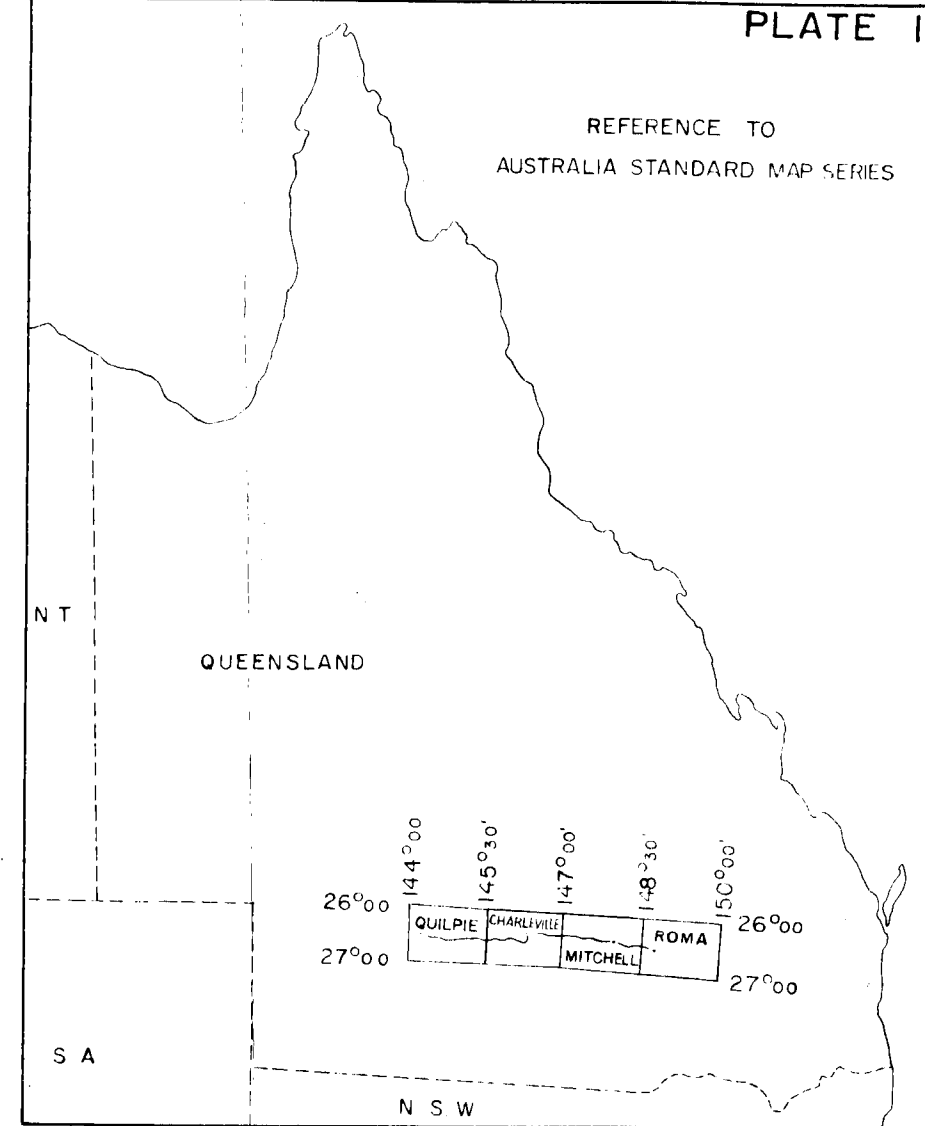
The Geological Map of Queensland (published by the Mines Department, 1953) shows that a belt of volcanic, mainly basaltic, rocks crops out about 40 miles west of Roma. It is probable that the distribution of these rocks is more extensive at depth, but there is no distinct increase in gravity readings associated with them, such as is obtained farther north along gravity traverses in the Bowen Basin.

The interval between the pendulum measurements at Quilpie and Roma is 28.0 mgal (Dooley *et al*, 1961). The adjusted interval is 28.4 mgal (Dooley, in preparation). The interval measured by gravity meter in the present survey is 28.96 mgal. The difference (0.56 mgal) has been distributed throughout the interval, and these modified observed gravity values have been used to give the Bouguer anomaly values shown on Plate 1.

3. REFERENCES

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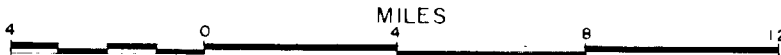
REFERENCE TO
AUSTRALIA STANDARD MAP SERIES



REGIONAL GRAVITY TRAVERSE

QUILPIE TO ROMA, QUEENSLAND 1960

TRAVERSE PLAN SHOWING STATION ELEVATIONS
ABOVE SEA LEVEL, AND BOUGUER ANOMALY VALUES



LEGEND

- Private company seismic shot-points
- SP 707 (Phillips Petroleum Co, Sunray Mid Continent Oil Co)
- 957.0' Elevation (feet)
- 41.56 Relative Bouguer Anomaly (milligals)
- 4-71 BMR Gravity Meter Station
- ▲ 58 BMR Pendulum Station No 58
- BM Station Bench Mark

