

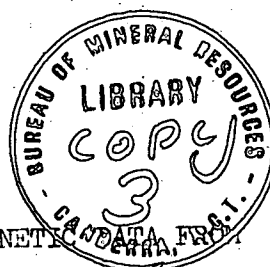
DEPARTMENT OF
MINERALS AND ENERGY



BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

RECORD 1974/156

007184



RECONTOURED MAGNETIC DATA FROM

PART OF THE 1960 AIRBORNE SURVEY OF THE
TENNANT CREEK 1:250 000 SHEET AREA OF N.T.

by

E.P. SHELLEY

The information contained in this report has been obtained by the Department of Minerals and Energy as part of the policy of the Australian 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 It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and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.

BMR
Record
1974/156
c.3

RECORD 1974/156

RECONTOURED MAGNETIC DATA FROM
PART OF THE 1960 AIRBORNE SURVEY OF THE
TENNANT CREEK 1:250 000 SHEET AREA OF N.T.

by

E.P. SHELLEY

CONTENTS

Page

SUMMARY

1. INTRODUCTION	1
2. DATA PROCESSING	2
3. RESULTS	3
4. REFERENCES	4

ILLUSTRATIONS

Figure 1. Locality map

- Plate 1. Preliminary total magnetic intensity - Billiatt 1:100 000 Sheet
- Plate 2. Preliminary total magnetic intensity - Kelly 1:100 000 Sheet
- Plate 3. Preliminary total magnetic intensity - Tennant Creek 1:100 000 Sheet
- Plate 4. Preliminary total magnetic intensity - Gosse River 1:100 000 Sheet
- Plate 5. Preliminary total magnetic intensity - Barkly 1:100 000 Sheet

SUMMARY

The magnetic data from part of the 1960 Tennant Creek airborne survey in the Northern Territory has been recontoured at a contour interval of 10 gammas.

Many anomalies on the original maps have been better defined by the closer contour interval and additional anomalies with amplitudes of less than 50 gammas have been delineated. The data have not been interpreted.

Copies of the recontoured data are available from the Australian Government Printer, Canberra.

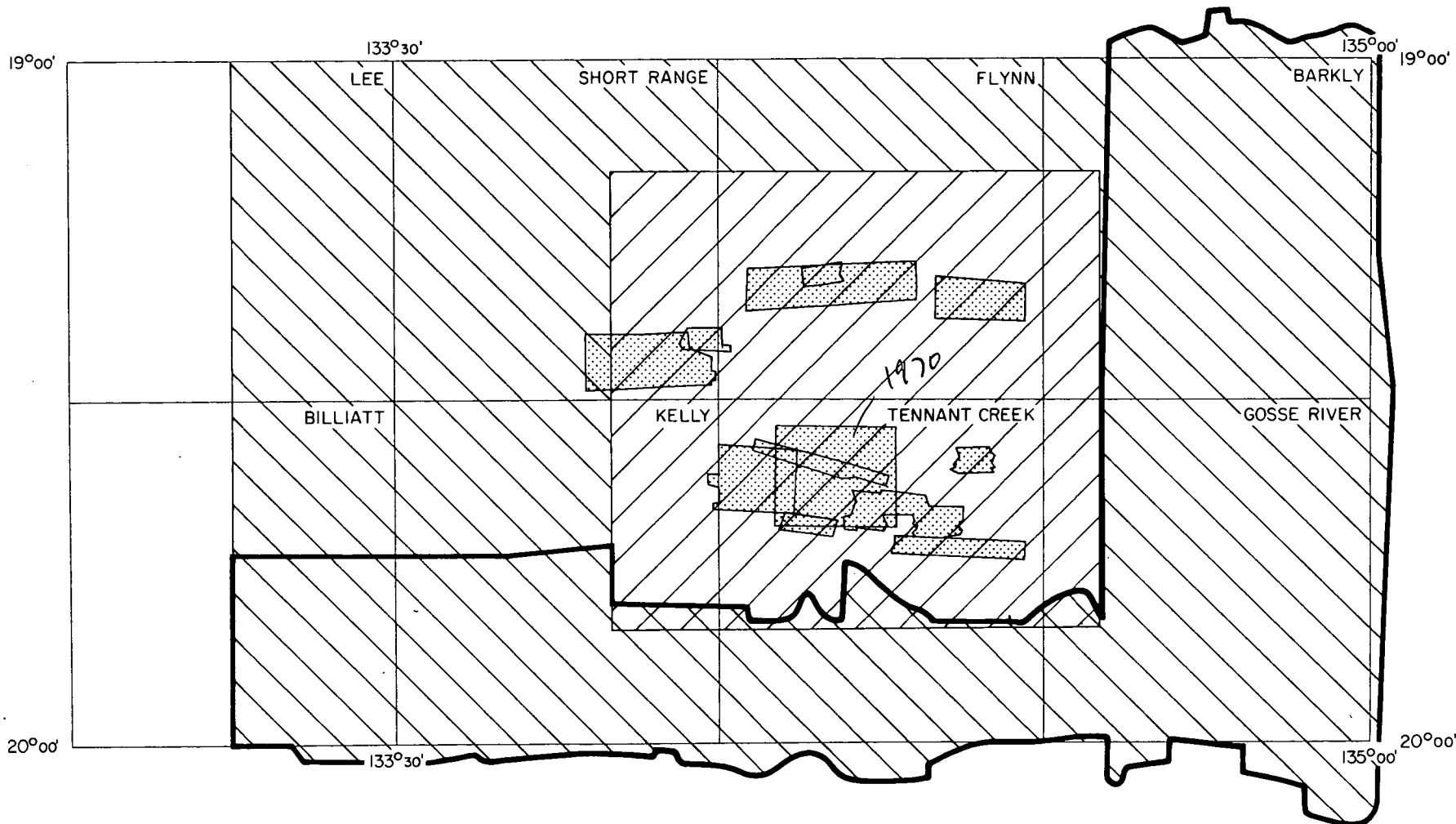
1. INTRODUCTION

Airborne surveys in the Tennant Creek region were begun by the Bureau of Mineral Resources (BMR) to assist in the development of the Tennant Creek Mineral Field. In 1956, an airborne magnetic and radiometric survey was made over an area (Fig. 1) which included all the known workings in the Field. The survey was flown at an altitude of 150 m above ground level along Shoran-controlled arcs at 300 m spacing. The magnetic data were published in 1957 as a series of maps at a scale of 1:63 360, and again in 1958 as one map at a scale of 1:126 720.

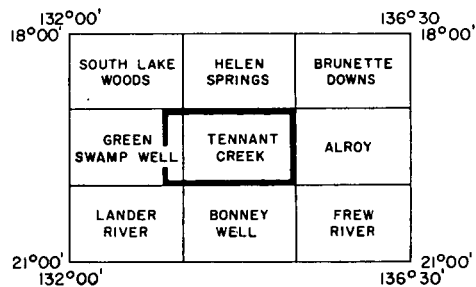
In 1960, the survey was extended to cover the rest of the TENNANT CREEK 1:250 000 map area and the eastern edge of the GREEN SWAMP WELL map area (Spence, 1962). In the northern and western parts of this area, the survey was made along north-south lines spaced at 300 m and controlled by Shoran. In the eastern and southern parts, the flight-lines were 1.5 km apart and aerial photographs were used for navigation. The survey altitude was 150 m above ground level.

The magnetic data from the 1956 and 1960 surveys were combined and published in 1962 at a scale of 1:126 720 (BMR, 1962a, b, c, d). The contour interval was 50 gammas.

From the results of these surveys, eleven areas of particular interest, totalling approximately 750 km², were selected for detailed aeromagnetic surveying. These surveys were made along east-west lines spaced at 150 m and at an altitude of 75 m above ground level in 1964, 1966, and 1967 (Milsom & Finney, 1965; Finney, 1967; Shelley & Browne-Cooper, 1967). The contour interval used in the presentation of the results of these detailed surveys was 10 gammas.

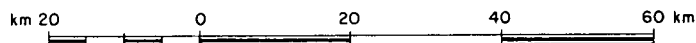


REFERENCE TO 1:250 000
MAP SERIES







AIRBORNE SURVEYS, TENNANT CREEK AREA, NT

LOCALITY MAP



LEGEND

-  1956 Survey
-  1960 Survey
-  1964, 1966, 1967, 1970 Surveys
-  Boundary of recontoured data

radiometer only

In 1968, it was not possible to include any airborne surveys in the Tennant Creek region in BMR's survey program. Because of increasing interest in the region it was decided to recontour the magnetic data from part of the 1960 survey at an interval of 10 gammas. The data within the TENNANT CREEK area south of $19^{\circ}45'S$ and east of $134^{\circ}35'E$ were recontoured (Fig. 1). Some data in the BONNEY WELL and GREEN SWAMP WELL areas were also included. This region was that flown at 1.5 km line spacing. No attempt was made to recontour the data from the closer-spaced, Shoran-controlled lines because of the large amount of data involved.

A full description of the methods and equipment used in the 1960 survey is given by Spence (1962).

2. DATA PROCESSING

Contour cuts at 10 gamma intervals were transferred from the magnetometer charts to the flight-line overlays using the original base-lines. The original 50-gamma contour cuts were retained. The regional gradient in total magnetic intensity of 4.7 gammas/km in a direction of 175° was not removed from the data.

Preliminary contours were then drawn and the resultant contour maps enlarged slightly to a scale of 1:100 000.

3. RESULTS

The recontoured data superimposed on flight line plots are displayed in Plates 1 to 5.

Many anomalies which were present in the original contouring as inflexions and embayments are now better defined owing to the closer contour interval. Additional anomalies with amplitudes of less than 50 gammas have been delineated. In some places the form of the 50-gamma contours has been changed from that originally published as the closer contour interval has provided better definition of them.

As the regional gradient has not been removed, the east-southeast trend in the contour pattern which reflects the geological trend is accentuated.

The recontoured data have not yet been interpreted. An interpretation of the data is proposed in a general review of airborne geophysical results in the Tennant Creek region to be commenced in the near future.

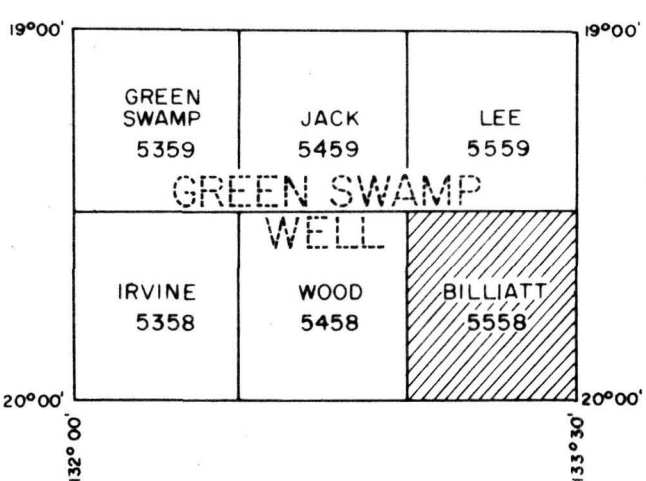
Dyeline and transparent copies of the recontoured data are available from the Copy Service, Government Printer (Production), P.O. Box 84, Canberra, A.C.T., 2600.

4. REFERENCES

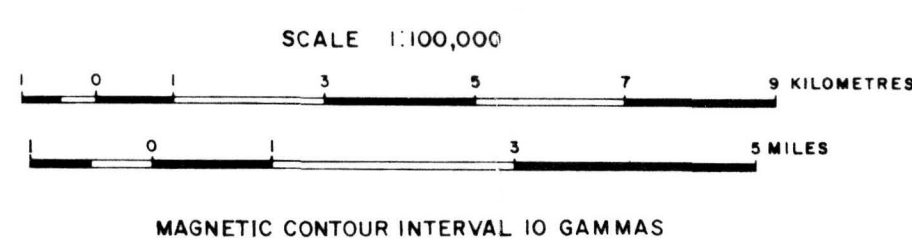
- BMR, 1962a - Tennant Creek - N.W., Northern Territory. Total Magnetic Intensity and Radioactivity. Bur. Miner. Resour. Aust. G237-11.
- BMR, 1962b - Tennant Creek - N.E., Northern Territory. Ibid. G237-12.
- BMR, 1962c - Tennant Creek, S.W., Northern Territory. Ibid. G237-13.
- BMR, 1962d - Tennant Creek - S.E., Northern Territory. Ibid. G237-14.
- FINNEY, W.A., 1967 - Tennant Creek detailed aeromagnetic survey, N.T. 1966. Bur. Miner. Resour. Aust. Rec. 1967/35 (unpubl.).
- MILSOM, J.S., & FINNEY, W.A., 1965 - Tennant Creek detailed aeromagnetic survey, Northern Territory, 1964. Bur. Miner. Resour. Aust. Rec. 1965/50 (unpubl.).
- SHELLEY, E.P., & BROWNE-COOPER, P.J., 1967 - Tennant Creek detailed aeromagnetic survey, Northern Territory, 1967. Bur. Miner. Resour. Aust. Rec. 1967/151 (unpubl.).
- SPENCE, A.G., 1962 - Tennant Creek area airborne magnetic and radiometric survey, Northern Territory, 1960. Bur. Miner. Resour. Aust. Rec. 1962/99 (unpubl.).



INDEX TO 1:100,000 MAP SERIES



PRELIMINARY TOTAL MAGNETIC INTENSITY

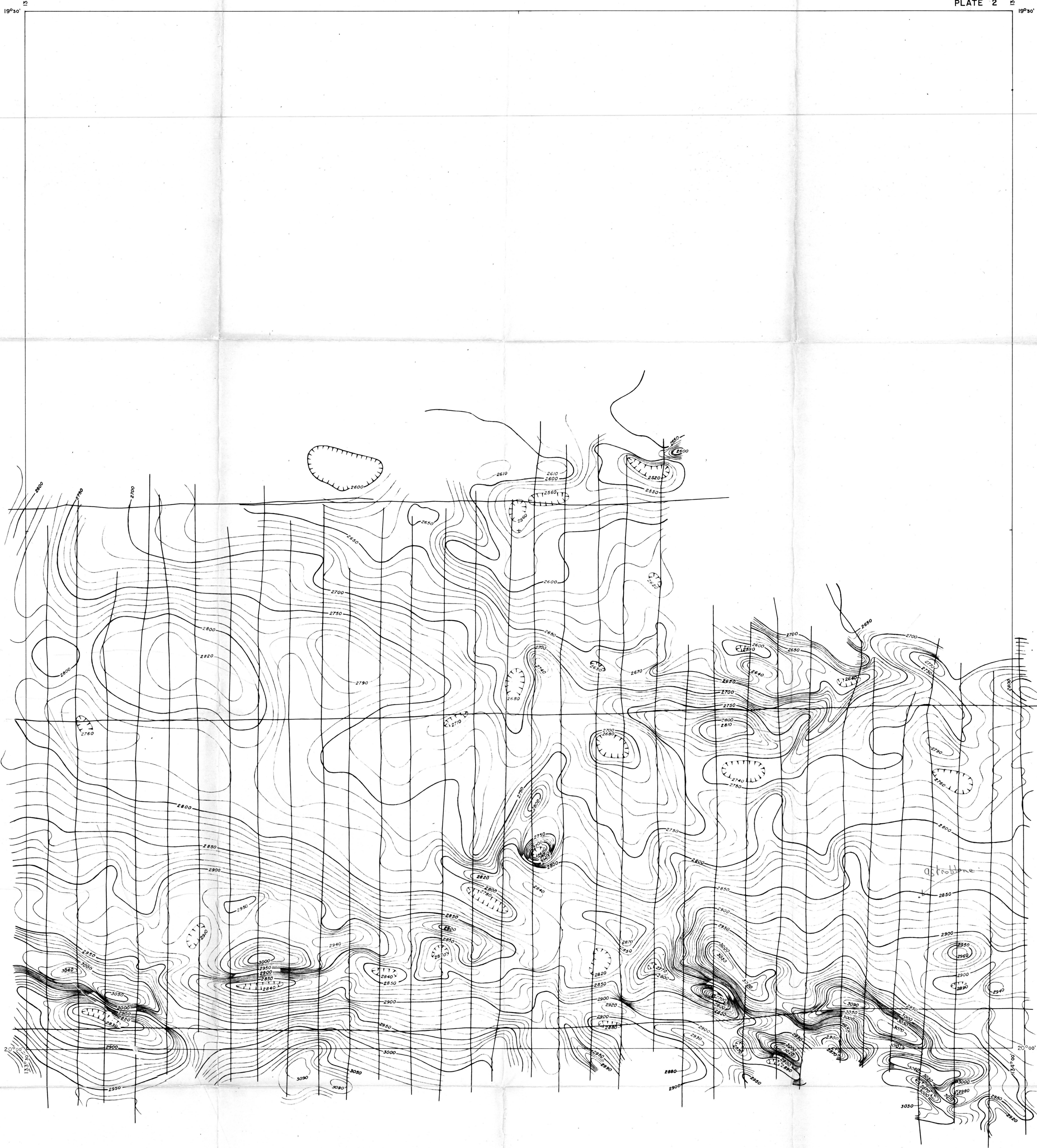


NOTE: THE INFORMATION CONTAINED IN THIS MAP HAS BEEN OBTAINED BY THE DEPARTMENT OF MINERALS AND ENERGY, AS PART OF THE POLICY OF THE AUSTRALIAN GOVERNMENT, TO ASSIST IN THE EXPLORATION AND DEVELOPMENT OF MINERAL RESOURCES. IT MAY NOT BE PUBLISHED IN ANY FORM OR USED IN A COMPANY PROSPECTUS OR STATEMENT WITHOUT THE PERMISSION IN WRITING OF THE DIRECTOR, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

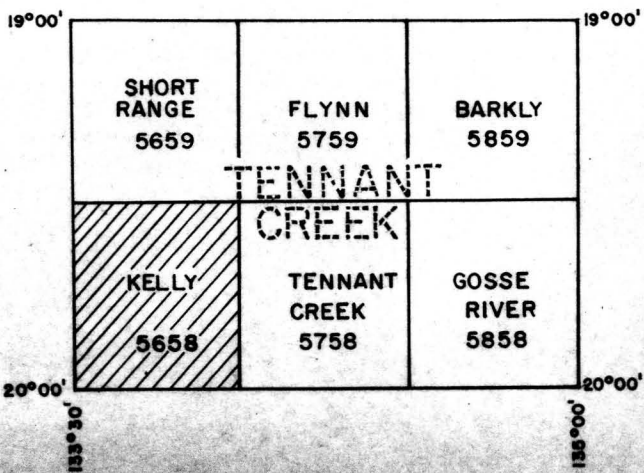
EXPLANATORY NOTES

THIS MAP WAS COMPILED FROM AN AIRBORNE MAGNETIC AND RADIO-METRIC SURVEY OF PART OF THE GREEN SWAMP WELL 1:250,000 MAP AREA MADE IN 1960 BY THE BUREAU OF MINERAL RESOURCES. THE SURVEY WAS MADE WITH A D.C. 3 AIRCRAFT AT A HEIGHT OF 150 METRES ABOVE GROUND-LEVEL ALONG NORTH-SOUTH LINES NOMINALLY SPACED 1.5 KILOMETRES APART. THE DATA FROM THIS SURVEY WERE ORIGINALLY PUBLISHED WITH 50 GAMMA CONTOUR INTERVALS ON MAPS G237-12, G237-13, AND G237-14. THE DATA HAVE BEEN RE-CONTOURED WITH 10 GAMMA CONTOUR INTERVALS IN AN EFFORT TO DELINEATE LOW AMPLITUDE ANOMALIES WHICH MAY BE OF INTEREST. THE TOTAL MAGNETIC INTENSITY HAS NOT BEEN CORRECTED FOR THE REGIONAL GRADIENT IN TOTAL MAGNETIC FIELD.

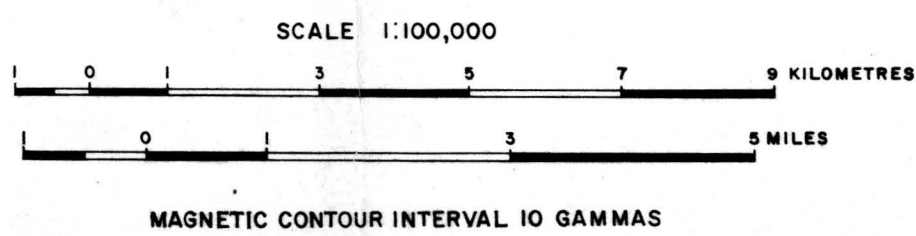
BILLIATT
GREEN SWAMP WELL N T
E53/BI-5558



INDEX TO 1:100,000 MAP SERIES



PRELIMINARY TOTAL MAGNETIC INTENSITY

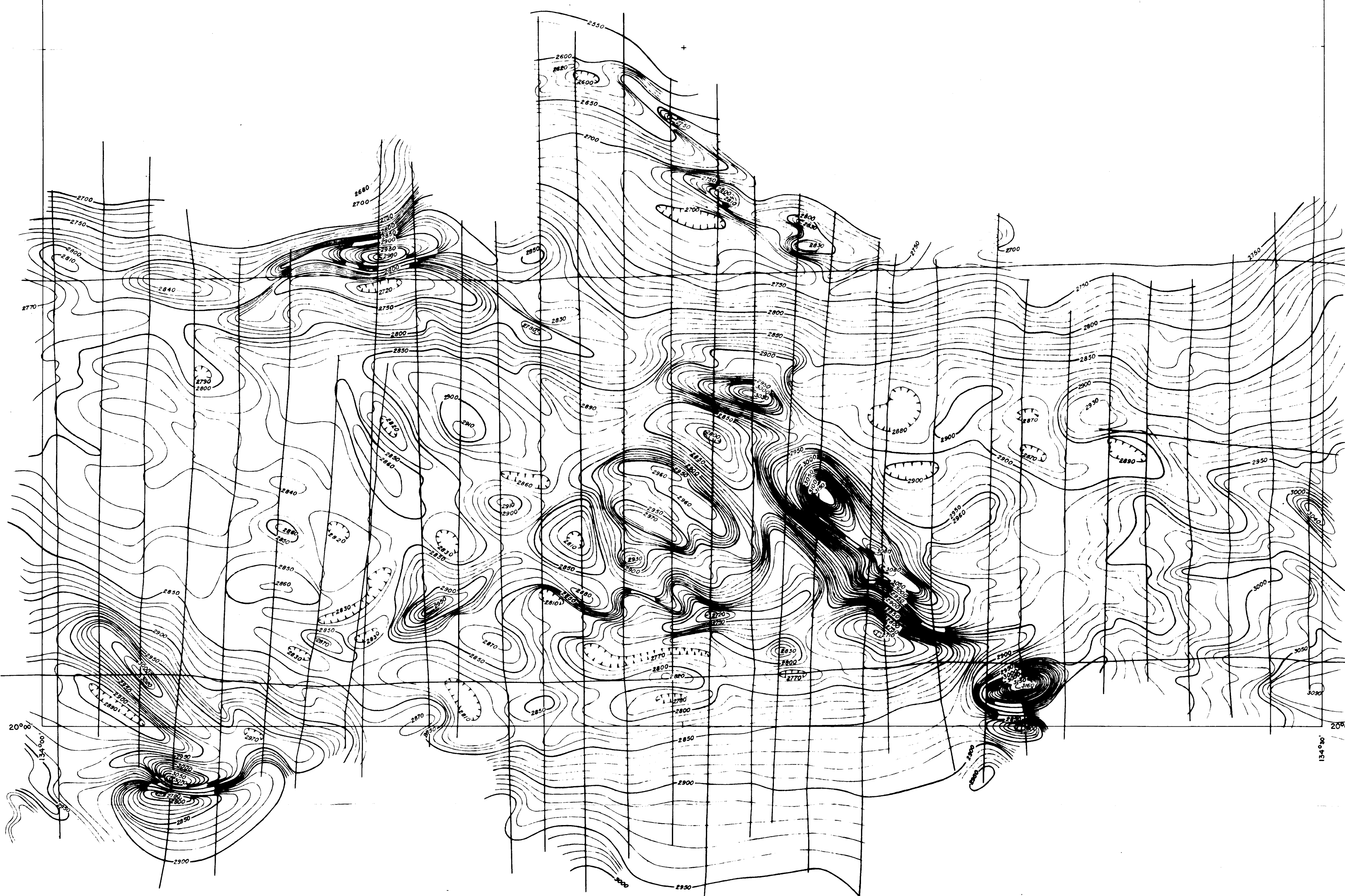


NOTE: THE INFORMATION CONTAINED IN THIS MAP HAS BEEN OBTAINED BY THE DEPARTMENT OF MINERALS AND ENERGY, AS PART OF THE POLICY OF THE AUSTRALIAN GOVERNMENT, TO ASSIST IN THE EXPLORATION AND DEVELOPMENT OF MINERAL RESOURCES. IT MAY NOT BE PUBLISHED IN ANY FORM OR USED IN A COMPANY PROSPECTUS OR STATEMENT WITHOUT THE PERMISSION IN WRITING OF THE DIRECTOR, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

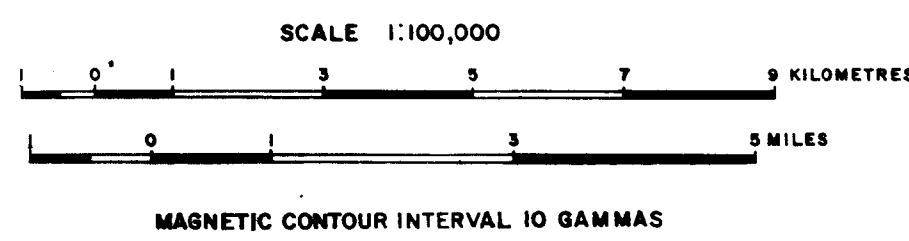
EXPLANATORY NOTES

THIS MAP WAS COMPILED FROM AN AIRBORNE MAGNETIC AND RADIO-METRIC SURVEY OF PART OF THE TENNANT CREEK 1:250,000 MAP AREA MADE IN 1960 BY THE BUREAU OF MINERAL RESOURCES. THE SURVEY WAS MADE WITH A D.C. AIRCRAFT AT A HEIGHT OF 150 METRES ABOVE GROUND-LEVEL ALONG NORTH-SOUTH LINES NOMINALLY SPACED 1.5 KILOMETRES APART. THE DATA FROM THIS SURVEY WERE ORIGINALLY PUBLISHED WITH 50 GAMMA CONTOUR INTERVALS ON MAPS 6237-12, 6237-13, AND 6237-14. THE DATA HAVE BEEN RE-CONTOURED WITH 10 GAMMA CONTOUR INTERVALS IN AN EFFORT TO DELINEATE LOW AMPLITUDE ANOMALIES WHICH MAY BE OF INTEREST. THE TOTAL MAGNETIC INTENSITY HAS NOT BEEN CORRECTED FOR THE REGIONAL GRADIENT IN TOTAL MAGNETIC FIELD.

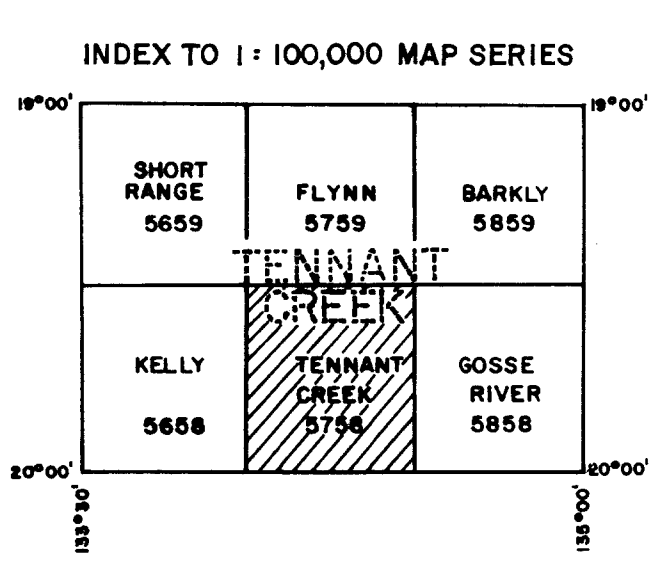
KELLY
TENNANT CREEK N T
E55/BI-5658



PRELIMINARY TOTAL MAGNETIC INTENSITY



NOTE: THE INFORMATION CONTAINED IN THIS MAP HAS BEEN OBTAINED BY THE DEPARTMENT OF MINERALS AND ENERGY, AS PART OF THE POLICY OF THE AUSTRALIAN 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.



EXPLANATORY NOTES

THIS MAP WAS COMPILED FROM AN AIRBORNE MAGNETIC AND RADIO-METRIC SURVEY OF PART OF THE TENNANT CREEK 1:250,000 MAP AREA MADE IN 1960 BY THE BUREAU OF MINERAL RESOURCES. THE SURVEY WAS MADE WITH A D.C. AIRCRAFT AT A HEIGHT OF 150 METRES ABOVE GROUND-LEVEL ALONG NORTH-SOUTH LINES NOMINALLY SPACED 1.5 KILOMETRES APART.

THE DATA FROM THIS SURVEY WERE ORIGINALLY PUBLISHED WITH 50 GAMMA CONTOUR INTERVALS ON MAPS 5827-14, 5827-15, AND 5827-16. THE DATA HAVE BEEN RE-CONTOURED WITH 10 GAMMA CONTOUR INTERVALS IN AN EFFORT TO DELINEATE LOW AMPLITUDE ANOMALIES WHICH MAY BE OF INTEREST.

THE TOTAL MAGNETIC INTENSITY HAS NOT BEEN CORRECTED FOR THE REGIONAL GRADIENT IN TOTAL MAGNETIC FIELD.

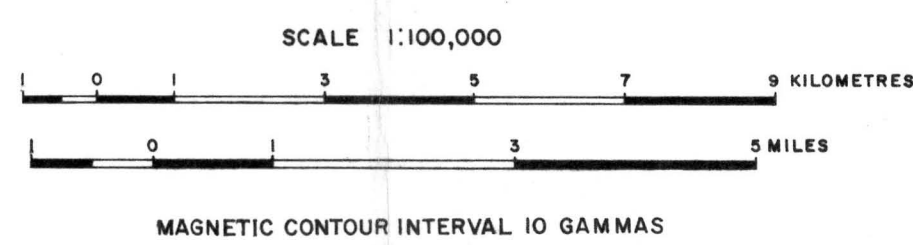
TENNANT CREEK
TENNANT CREEK N T
E53/BI-5758



INDEX TO 1:100,000 MAP SERIES

SHORT RANGE 5659	FLYNN 5759	BARKLY 5859
KELLY 5658	TENNANT CREEK 5758	GOSSE RIVER 5858

PRELIMINARY TOTAL MAGNETIC INTENSITY

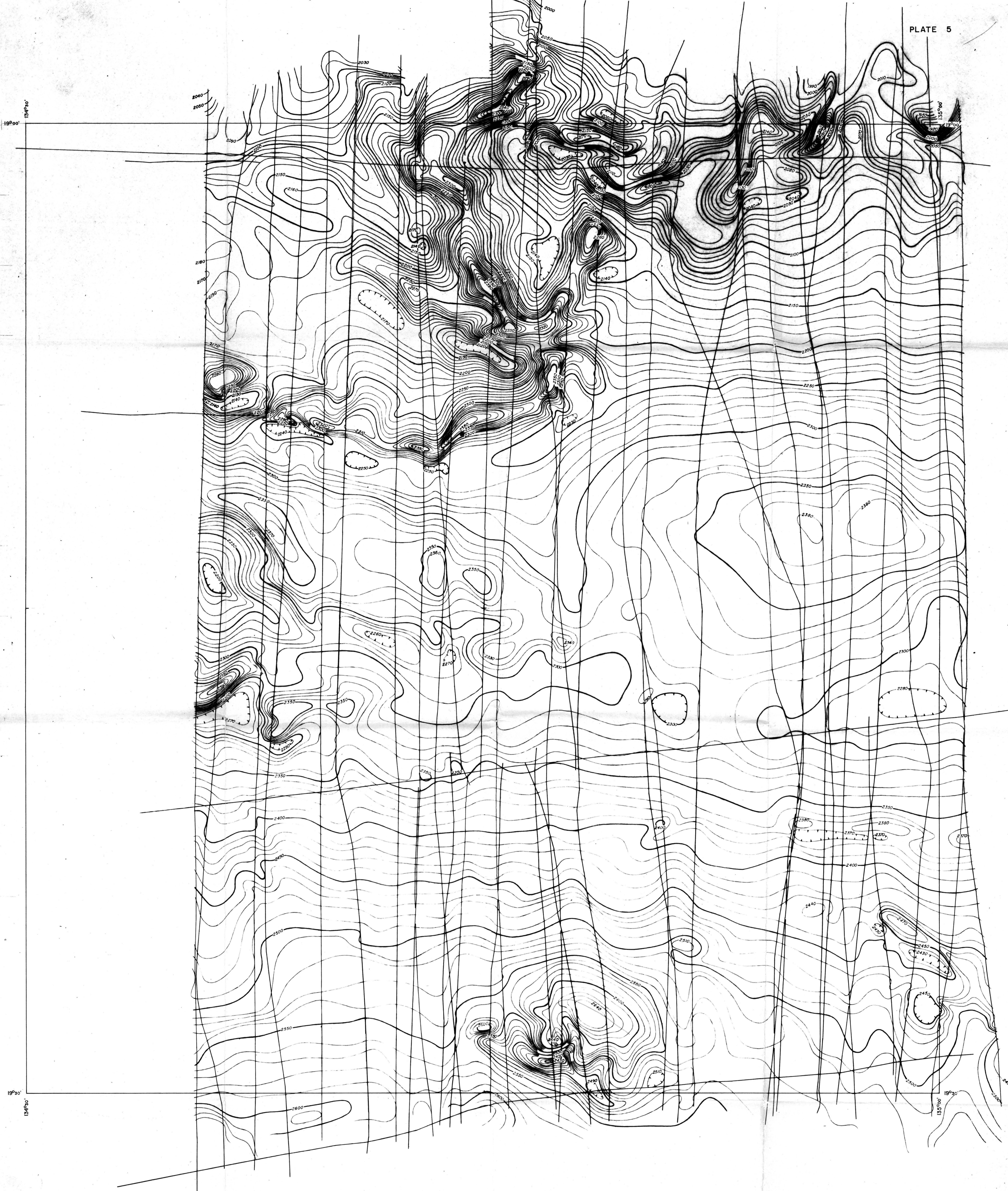


NOTE:
THE INFORMATION CONTAINED IN THIS MAP HAS BEEN OBTAINED BY THE DEPARTMENT OF MINERALS AND ENERGY, AS PART OF THE POLICY OF THE AUSTRALIAN GOVERNMENT, TO ASSIST IN THE EXPLORATION AND DEVELOPMENT OF MINERAL RESOURCES. IT MAY NOT BE PUBLISHED IN ANY FORM OR USED IN A COMPANY PROSPECTUS OR STATEMENT WITHOUT THE PERMISSION IN WRITING OF THE DIRECTOR, BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

EXPLANATORY NOTES

THIS MAP WAS COMPILED FROM AN AIRBORNE MAGNETIC AND RADIO-METRIC SURVEY OF PART OF THE TENNANT CREEK 1:250,000 MAP AREA MADE IN 1960 BY THE BUREAU OF MINERAL RESOURCES. THE SURVEY WAS MADE WITH A D.C. AIRCRAFT AT A HEIGHT OF 150 METRES ABOVE GROUND-LEVEL ALONG NORTH-SOUTH LINES NOMINALLY SPACED 1.5 KILOMETRES APART.
THE DATA FROM THIS SURVEY WERE ORIGINALLY PUBLISHED WITH 50 GAMMA CONTOUR INTERVALS ON MAPS 6237-12, 6237-13, AND 6237-14. THE DATA HAVE BEEN RE-CONTOURED WITH 10 GAMMA CONTOUR INTERVALS IN AN EFFORT TO ELIMINATE LOW AMPLITUDE ANOMALIES WHICH MAY BE OF INTEREST.
THE TOTAL MAGNETIC INTENSITY HAS NOT BEEN CORRECTED FOR THE REGIONAL GRADIENT IN TOTAL MAGNETIC FIELD.

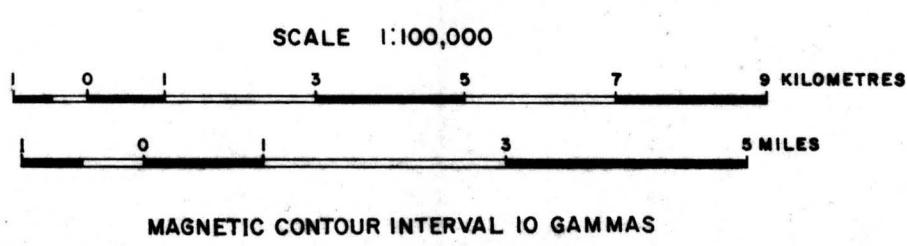
GOSSE RIVER
TENNANT CREEK N T
E53/B1-5858



INDEX TO 1:100,000 MAP SERIES

SHORT RANGE 5659	FLYNN 5759	BARKLY 5859
KELLY 5658	TENNANT CREEK 5758	GOSSE RIVER 5858

PRELIMINARY TOTAL MAGNETIC INTENSITY



NOTE: THE INFORMATION CONTAINED IN THIS MAP HAS BEEN OBTAINED BY THE DEPARTMENT OF MINERALS AND ENERGY, AS PART OF THE POLICY OF THE AUSTRALIAN 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.

EXPLANATORY NOTES

THIS MAP WAS COMPILED FROM AN AIRBORNE MAGNETIC AND RADIO-METRIC SURVEY OF PART OF THE TENNANT CREEK 1:50,000 MAP AREA MADE IN 1960 BY THE BUREAU OF MINERAL RESOURCES. THE SURVEY WAS MADE WITH A D.C. AIRCRAFT AT A HEIGHT OF 150 METRES ABOVE GROUND-LEVEL ALONG NORTH-SOUTH LINES NOMINALLY SPACED 15 KILOMETRES APART. THE DATA FROM THIS SURVEY WERE ORIGINALLY PUBLISHED WITH 10 GAMMA CONTOUR INTERVALS ON MAPS 5657-58, 5657-59, AND 5657-60. THE DATA HAVE BEEN RE-CONTOURED WITH 10 GAMMA CONTOUR INTERVALS IN AN EFFORT TO DELINEATE LOW AMPLITUDE ANOMALIES WHICH MAY BE OF INTEREST. THE TOTAL MAGNETIC INTENSITY HAS NOT BEEN CORRECTED FOR THE REGIONAL GRADIENT IN TOTAL MAGNETIC FIELD.

BARKLY
TENNANT CREEK N T
E53/BI-5859