COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD No. 1964/19

RED BLUFF ANOMALY No. 11

MAGNETIC SURVEY,

TENNANT CREEK, N T 1963

by

A. DOUGLAS

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SUMMARY

One traverse across Red Bluff Anomaly No. 11, Tennant Creek was investigated with vertical and horizontal-force magnetometers at the request of Australian Development N.L. The results indicate that the anomaly is due to two magnetic bodies; estimates have been made of the depth, position, and size of these bodies.

1. INTRODUCTION

Whilst prospecting an area around the Red Bluff trig station, near Tennant Creek, NT, by means of vertical-component magnetic surveys, Australian Development N.L. has delineated magnetic anomalies of a type that may be due to buried ironstone bodies similar to those associated with the known orebodies of the Tennant Creek field. The interpretation of magnetic surveys at Tennant Creek has been discussed by Daly (1957) and it has been shown that, although vertical-component measurements form a convenient means of locating magnetic anomalies, horizontal-component measurements along a traverse over the centre of an anomaly often provide a more useful basis for accurate estimates of the depth and position of the bodies causing the anomaly. For this reason, Australian Development N.L. requested that the Bureau of Mineral Resources, Geology and Geophysics should make horizontal-component measurements along one traverse over the centre of an anomaly known as the Red Bluff Anomaly No. 11.

The measurements were made along Traverse 340W of the Australian Development survey grid. The position of the traverse, which bears true north, is shown approximately on Plate 1, but information is not available to enable accurate location of the Australian Development grid with reference to survey marks. The field work was done in October 1963 by A. Douglas of the Bureau's Darwin office.

2. INTERPRETATION OF RESULTS

The results are shown on Plate 2. Interpretation by the methods described by Daly (1957) suggest that the anomaly is caused by two separate magnetic bodies, located as follows:

Position of centre of body	242.5S	270.5S
Depth of centre of body (ft)	1260	3400
Radius of body (ft)	300	900

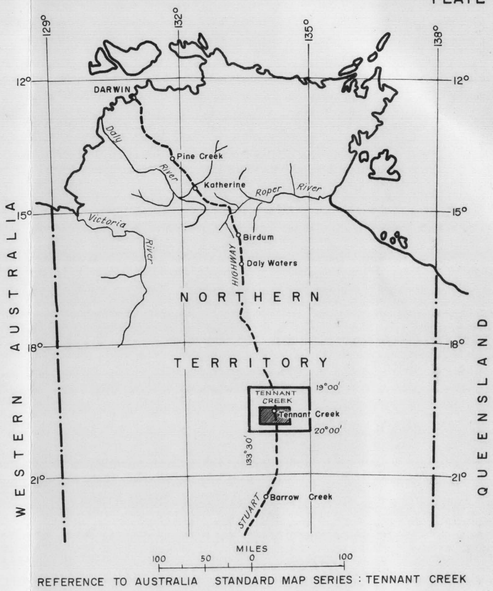
The radii of the bodies are calculated on the assumption that the bodies are spherical and composed mainly of magnetite. As it is practically certain that the bodies are not spherical, the values of the radii quoted give no information on the actual dimensions in horizontal cross-section, but it is considered that they give an estimate of the minimum possible extent in vertical cross-section. If the bodies are not composed of massive magnetite, but consist of bodies of slate containing disseminated magnetite, their extent in vertical cross-section may be very much greater. In either case, however, drill holes aimed at the calculated positions of the centres will intersect the bodies close to their actual centres.

Plate 2 also shows magnetic profiles calculated on the assumption that the anomalies are due to spherical magnetic bodies located as shown. The fit of observed and calculated horizontal-component profiles is satisfactory. The fit of the vertical-component profiles is not close; it is possible that the observed profile contains regional effects, but information is not available to check this. However, the closeness of the fit of the horizontal-component profiles indicates that the calculated positions of the centres provide suitable targets for intersecting the bodies by drill holes.

3. REFERENCE

DALY, J. 1957 Magnetic prospecting at Tennant Creek, Northern Territory 1935-37. Bur. Min. Resour. Aust. Bull. 44.

PLATE I



REFERENCE TO AUSTRALIA STANDARD MAP SERIES : TENNANT CREEK

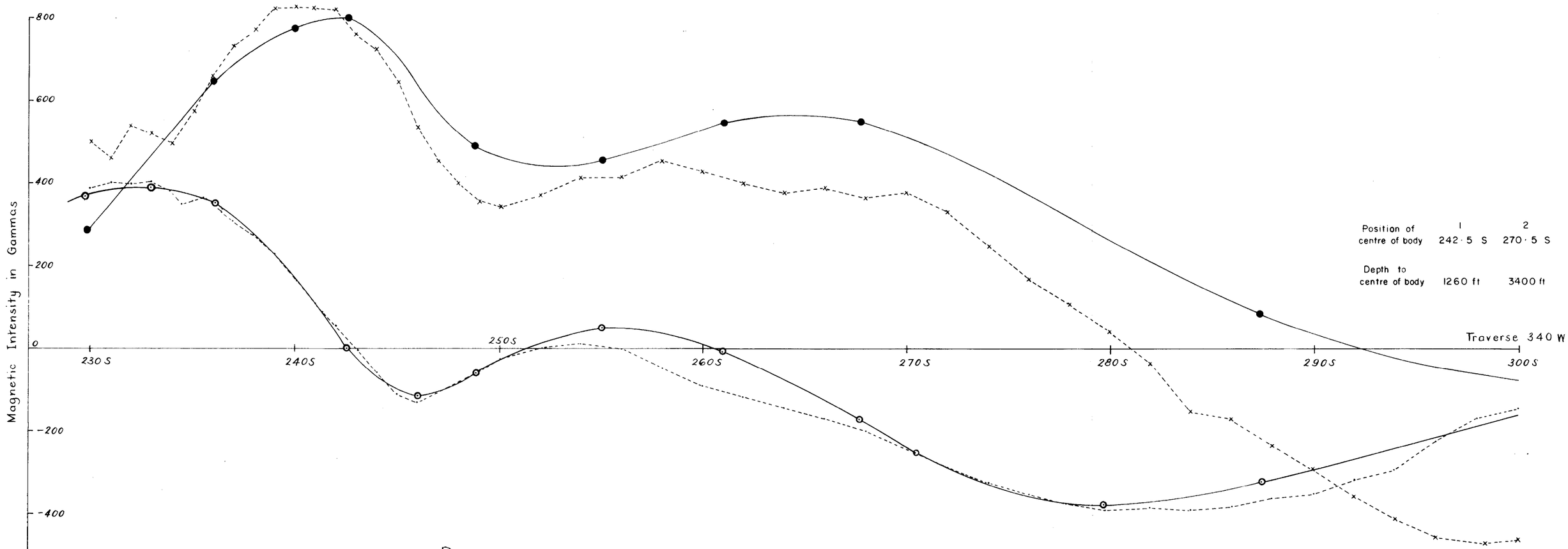
RED BLUFF ANOMALY II MAGNETIC SURVEY
TENNANT CREEK, NT
GROUND MAGNETIC SURVEY, 1963

LOCALITY MAP
SHOWING
TOTAL MAGNETIC INTENSITY
MEASURED BY AIRBORNE MAGNETOMETER

MILES

Geophysical Branch, Bureau of Mineral Resources, Geology and Geophysics. E 53/87-12
TO ACCOMPANY RECORD No.1964/19

PLATE 2



Reference

Observed horizontal-component variation

" vertical- " "

Calculated horizontal-component variation

" vertical- " "

RED BLUFF ANOMALY II MAGNETIC SURVEY

COMPARISON OF OBSERVED AND CALCULATED MAGNETIC PROFILES

Scale

400 0 400 800 1200 FT

Bureau of Mineral Resources, Geology and Geophysics, Darwin N T November 1963

To Accompany Record No 1964/19

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