

62/123
C.3

COMMONWEALTH OF AUSTRALIA

LIBRARY
NON-LENDING COPY
NOT TO BE REMOVED
FROM LIBRARY

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

012935



RECORD No. 1962/123

AREA 55 WEST GEOPHYSICAL SURVEY, RUM JUNGLE DISTRICT, NT 1961

by

A. Douglas

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 It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and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

RECORD No. 1962 / 123

AREA 55 WEST GEOPHYSICAL SURVEY, RUM JUNGLE DISTRICT, N.T. 1961

by

A. Douglas

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 It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and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

CONTENTS

	<u>Page</u>
SUMMARY	
1. INTRODUCTION	1
2. HISTORY AND GEOLOGY	1
3. GEOPHYSICAL RESULTS	2
4. DISCUSSION OF RESULTS	3
5. CONCLUSIONS AND RECOMMENDATIONS	3
6. REFERENCES	4

ILLUSTRATIONS

Plate 1.	Locality map	(Drawing No. G71-227-8)
Plate 2.	Radiometric contours	(G71-257)
Plate 3.	Slingram real-component contours	(G71-258)
Plate 4.	Slingram imaginary-component contours	(G71-259)
Plate 5.	Turam ratio contours	(G71-260)
Plate 6.	Turam phase contours	(G71-261)
Plate 7.	Geological map	(G71-262)

SUMMARY

The electromagnetic and radiometric surveys at Area 55 West are described. This work was carried out as part of the Bureau of Mineral Resources' 1961 programme of uranium prospecting in the Rum Jungle district, N.T.

An elongate weak (two-times-background) radiometric anomaly and five electromagnetic anomalies were outlined. Two of the electromagnetic anomalies lie in a region of radiometric and geochemical anomalies and should be tested by drilling. Another of the electromagnetic anomalies also seemed to warrant testing; however, the only conducting material intersected by a recent drill hole near this anomaly was black slate with no trace of mineralisation. Further drilling of this anomaly therefore is not recommended.

The remainder of the electromagnetic anomalies can be related directly to lithological and structural features and do not warrant further investigation at the present stage. More extensive geophysical surveys would be necessary to enable the full significance of the anomalies to be assessed.

1. INTRODUCTION

Area 55 West is one of nine areas of anomalous radioactivity selected for further investigation as part of a programme of uranium prospecting in the Rum Jungle Uranium Field. During August 1961, a geophysical survey of the area was made by the Darwin Uranium Group of the Bureau of Mineral Resources, and is described in this Record.

Area 55 West lies about two miles west of Rum Jungle Siding and some 2000 ft north-west of Area 55 (see Plate 1). The area is bordered on the north-west by the West Finnis River; access to the area is by a track from Rum Jungle Siding.

Traverse 18S of the 1960 geophysical grid for Area 55 was extended as far as 58W and used as a baseline for the Area 55 West geophysical grid. Thirteen parallel traverses up to 1600 ft long were surveyed at right angles to this baseline and were pegged at 50-ft intervals. The traverses were spaced 200 ft apart and numbered 34W to 58W. The relation of the geophysical grids to the Hundred of Goyder co-ordinates has not been established precisely; Lands and Surveys Branch, Northern Territory Administration, is at present resurveying the Hundred.

The entire 1961 grid was surveyed with electromagnetic (Slingram) and radiometric methods. In addition, the traverses between 34W and 52W were surveyed with the Turam electromagnetic method for the purpose of comparison. A description of these geophysical methods, their applicability to the search for uranium, and the methods of interpretation are given by Daly (1962).

2. HISTORY AND GEOLOGY

The radioactive anomaly at Area 55 West was first indicated by the 1952 airborne radiometric survey (Wood and McCarthy, 1952) and was subsequently examined on the ground by geologists of Territory Enterprises Pty Ltd. This ground survey outlined a small three-times-background anomaly. In 1958 the Bureau of Mineral Resources made a geochemical survey over the area (Haldane and Debnam, 1959) and this outlined some weak copper and lead anomalies (Plate 7).

During 1961 a programme of auger-drilling was carried out by the Bureau of Mineral Resources (Ruxton and Shields, in preparation). The drill holes were logged radiometrically and drilling samples were analysed for lead, copper, and zinc. Geological information obtained from this survey is shown on Plate 7.

The rocks of the area are a series of altered shales and limestones, folded into a pitching anticline; the axis of the anticline strikes roughly 060 degrees through 41W/18S and plunges northwards. A large shear zone crosses the eastern part of the area. From 38.6W/17S to the northern limit of the area the shear strikes 350 degrees; south from 38.6W/17S the strike is 030 degrees. Two smaller shears mapped near the centre of the area extend beyond its northern limit. One shear strikes 017 degrees from 46.7W/19.5S; the other strikes 014 degrees from 44.2W/18.6S.

The geochemical results of the 1961 survey outlined copper and lead anomalies along the junction of the calcareous beds with the shale sequence. Copper and lead values were particularly high where the junction abuts the main shear zone near the eastern end of the area.

The radiometric logging detected an anomaly that was roughly coincident with the surface anomaly. The highest recorded radioactivity was in the drill holes at 46N/18S and 42N/12S.

3. GEOPHYSICAL RESULTS

Electromagnetic results

Five anomalies (A to E) were outlined by the electromagnetic methods. The anomalies are more clearly shown by the Turam results (Plates 5 and 6) and most of the following discussion will centre on these results.

Anomaly A, the most intense anomaly, is well developed both in ratio and phase components. Its major axis extends from 41W/16.5S to 48W/16.75S. The maximum measured intensity occurs at 42W/16.25S which is close to the eastern end of the anomaly.

Anomaly B is almost as intense as A and strikes in roughly the same direction. The major axis of Anomaly B is nearly straight and extends from 38W/17.5S to 47W/19S. At 42W/18S the anomaly attains its maximum measured intensity. A minor maximum occurs near 46W/19S.

Anomaly C extends westward from 49W/20S to beyond Traverse 52W, the western limit of the Turam survey area. Westward from Traverse 52W the Slingram results show that the anomaly decreases in intensity but that it is still present at Traverse 58W, the western limit of the survey area.

Anomaly D is broader and less-clearly outlined than the anomalies described above. The western and northern limits of the anomaly were not delineated. The major axis of the phase anomaly does not coincide with that of the ratio anomaly. The major axis of the phase anomaly extends from 46W/12S to 52W/13.5S; that of the ratio anomaly extends from 44W/10.5S to 52W/13S. The intensity of the anomaly increases from east to west. The Slingram results show that the anomaly continues west from Traverse 52W and is still well-developed at 58W/17S on the western limit of the area.

Anomaly E is clearly outlined by the ratio results but is more intensely developed in the phase results which, however, were less regular than the ratio results. The axis of the anomaly is slightly curved and extends from 38W/16S to 44W/10S. The anomaly is still well-developed where it crosses the northern limit of the area.

Radiometric results

The radiometric results (Plate 2) outlined an elongate anomaly extending from 44W/15.5S to 51W/20S. The maximum reading obtained over this anomaly was 0.04 mr/hr (about two-times-background) at 50W/19.5S. The three-times-background anomaly outlined by Territory Enterprises Pty Ltd was not detected. However, this is to be expected as the previously delineated anomalous area lies between two traverses of the geophysical grid.

4. DISCUSSION OF RESULTS

Anomalies A and B appear to be the most important of the electromagnetic anomalies outlined. They cannot be related directly to lithology, as they cut across geological boundaries. Both anomalies lie in the region of the most intense geochemical and radiometric anomalies. One of the two auger-drill holes (49W/16S) with the highest measured radioactivity in the area lies on the axis of Anomaly A. Anomalies A and B could thus indicate zones of base metal mineralisation with associated uranium mineralisation, and therefore these two anomalies should be tested by drilling.

From the surface geology there is no obvious explanation of Anomaly C, but its axis is approximately in line with that of Anomaly B, and thus Anomalies B and C may have a similar origin. Therefore, Anomaly C would seem to warrant testing. However, the only conducting material intersected by a Territory Enterprises Pty Ltd diamond-drill hole at 52W/20.5S appears to be black slate with no trace of mineralisation. Thus there is little to recommend further drilling of this anomaly.

Anomalies D and E can be related directly to the geology of the area. Anomaly D coincides approximately with an outcrop of graphitic slate; Anomaly E coincides with the northern part of the main shear zone. These geological features are probably the conducting zones indicated by Anomalies D and E. Neither of these anomalies appears to warrant further investigation.

5. CONCLUSIONS AND RECOMMENDATIONS

Electromagnetic Anomalies A and B are the most important of the anomalies outlined and these should be tested by diamond-drilling. From the geophysical results Anomaly C also appeared to warrant testing but recent diamond-drilling by Territory Enterprises Pty Ltd suggests that black slate with no trace of mineralisation is the conducting material producing this anomaly.

Anomalies E and D can be related to lithological and structural features within the area and do not appear to require further investigation.

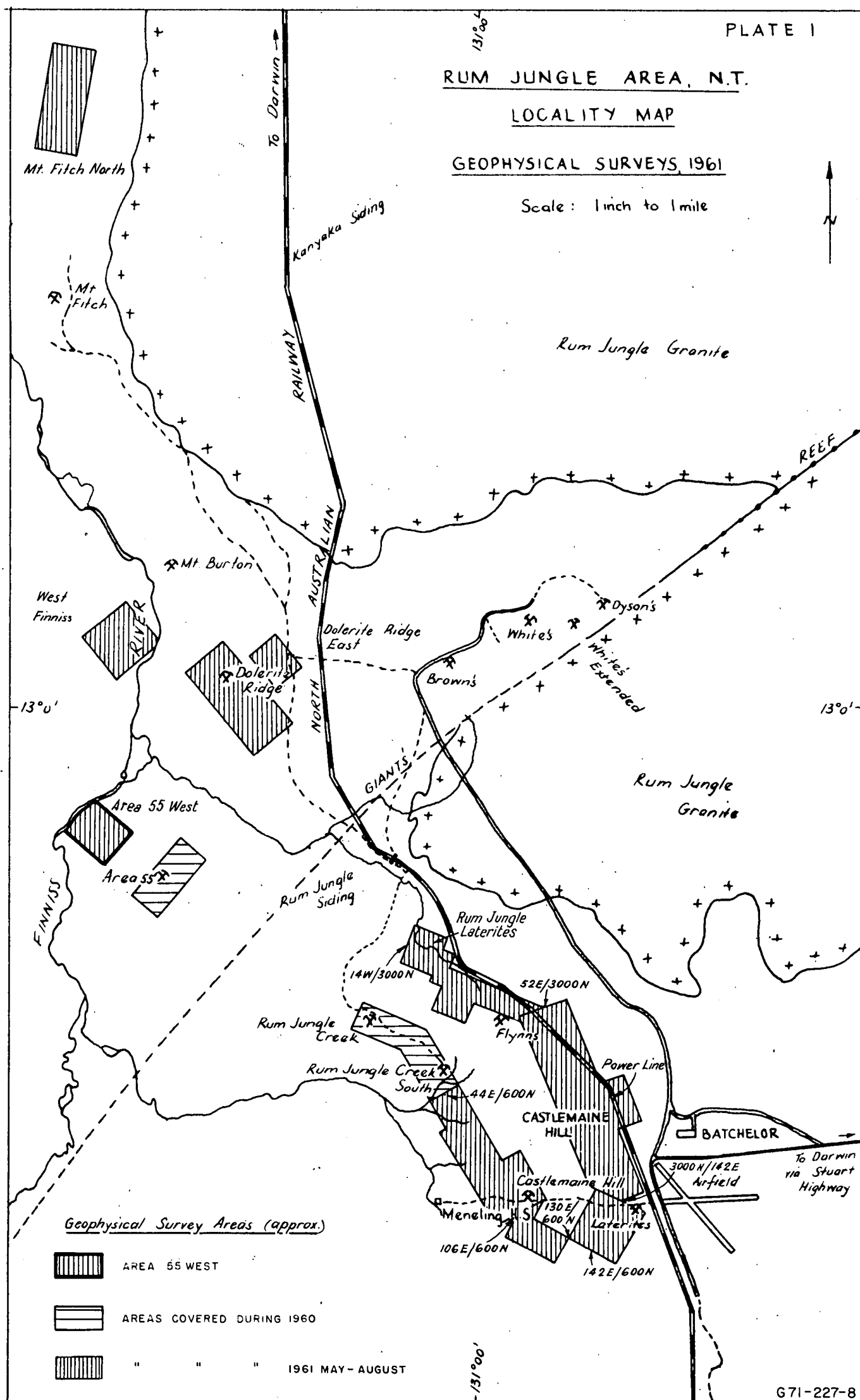
Drill holes to 150 ft vertical depth are recommended at 42W/16S and 42W/18S.

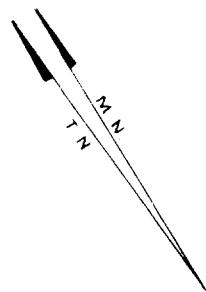
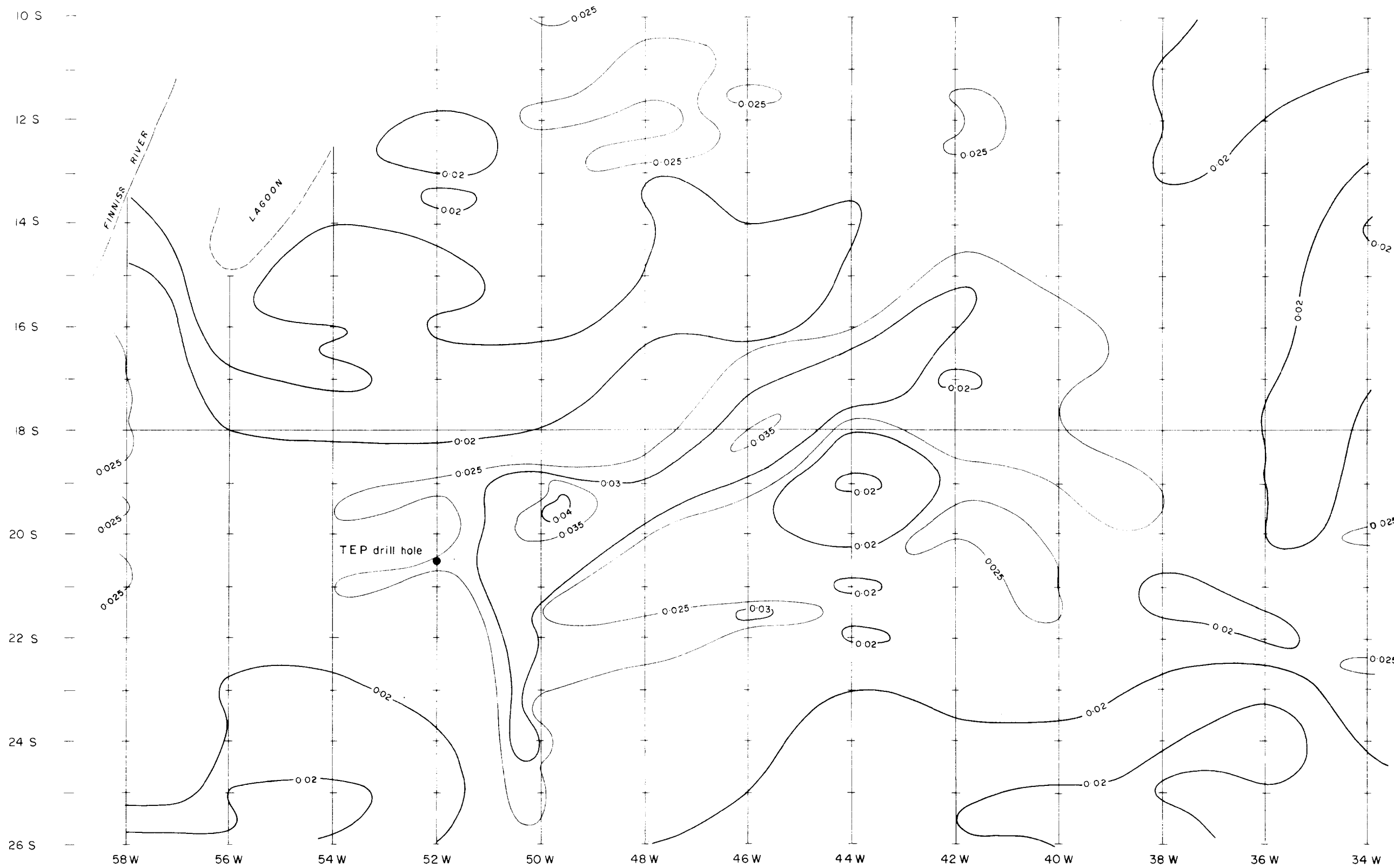
The above recommendations should be regarded as tentative. In general, mineralisation in the Rum Jungle district is associated with conducting bodies which persist over considerable lengths. Geological and geophysical observations indicate that Area 55 West is structurally complex. It is considered that a complete testing programme could only be recommended on the basis of extensive geophysical surveys that had indicated the main trends of conducting beds over a much larger area.

6. REFERENCES

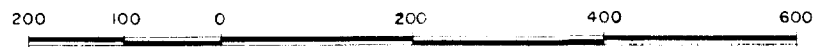
- | | | |
|-----------------------------------|------|---|
| DALY, J. | 1962 | Rum Jungle district, Northern Territory, introductory report on geophysical surveys 1960-61.
<u>Bur. Min. Resour. Aust. Record 1962/27.</u> |
| HALDANE, A.D. and
DEBNAM, A.H. | 1959 | Geochemical prospecting survey Rum Jungle, N.T. 1958.
<u>Bur. Min. Resour. Aust. Record C. 1959/3.</u> |
| RUXTON, B.P. and
SHIELDS, J.W. | | Geochemical and radiometric surveys Rum Jungle, N.T. 1961
<u>Bur. Min. Resour. Aust. Record (in preparation).</u> |
| WOOD, F.W. and
McCARTHY, E. | 1952 | Scintillometer airborne surveys over the Rum Jungle area and other portions of the Northern Territory
<u>Bur. Min. Resour. Aust. Record 1952/79.</u> |

Area 55 West





SCALE IN FEET

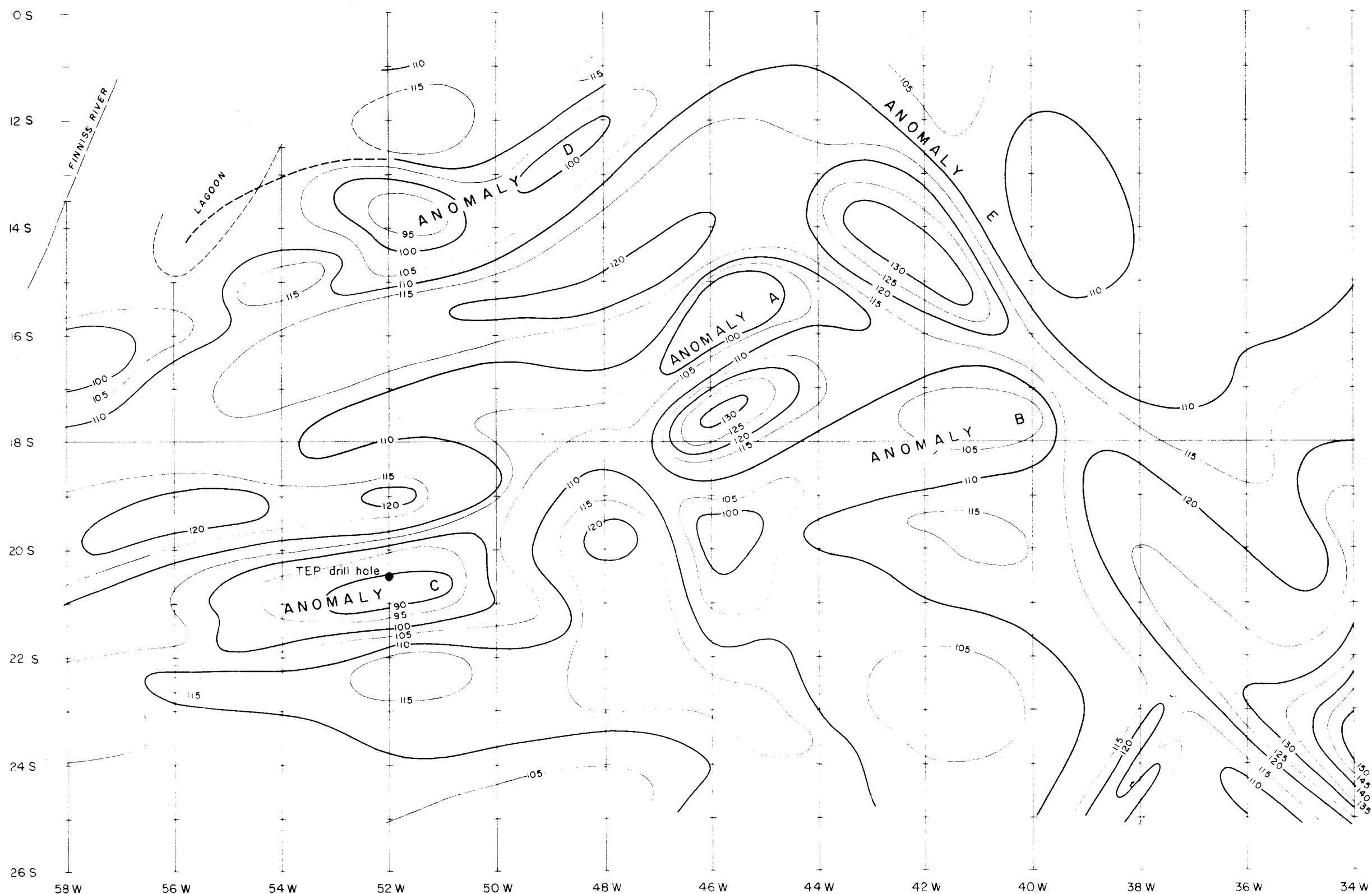


GEOPHYSICAL SURVEY IN THE RUM JUNGLE AREA, N.T., 1961

AREA 55 WEST

RADIOMETRIC CONTOURS

CONTOUR INTERVAL 0.005 mr/hr



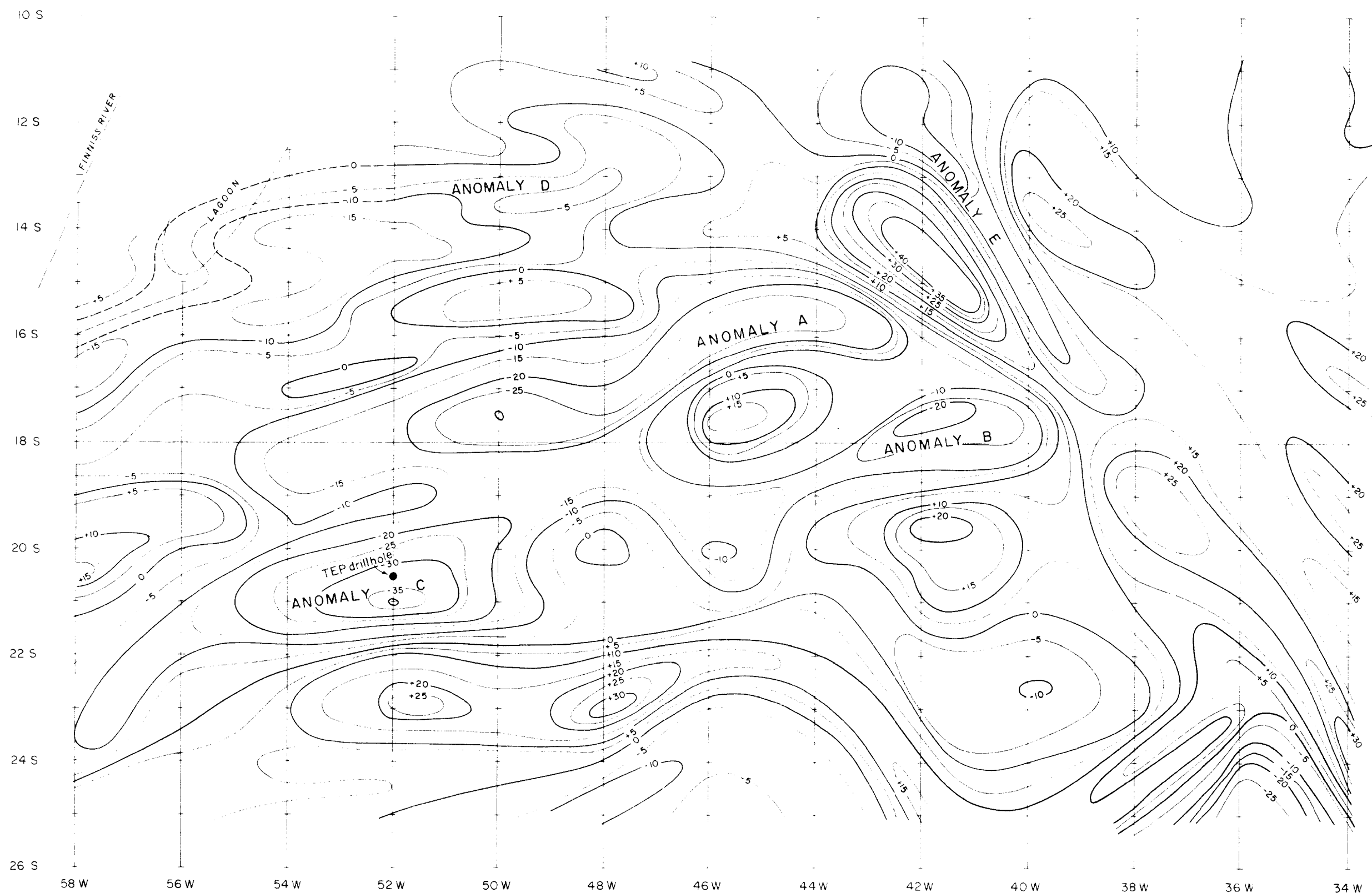
GEOPHYSICAL SURVEY IN THE RUM JUNGLE AREA, N.T., 1961

AREA 55 WEST

SLINGRAM REAL-COMPONENT CONTOURS

FREQUENCY 1760 c/s COIL SEPARATION 200'

CONTOUR INTERVAL 5%



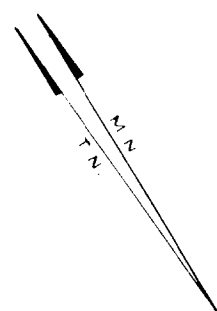
GEOPHYSICAL SURVEY IN THE RUM JUNGLE AREA, N.T., 1961

AREA 55 WEST

SLINGRAM IMAGINARY-COMPONENT CONTOURS

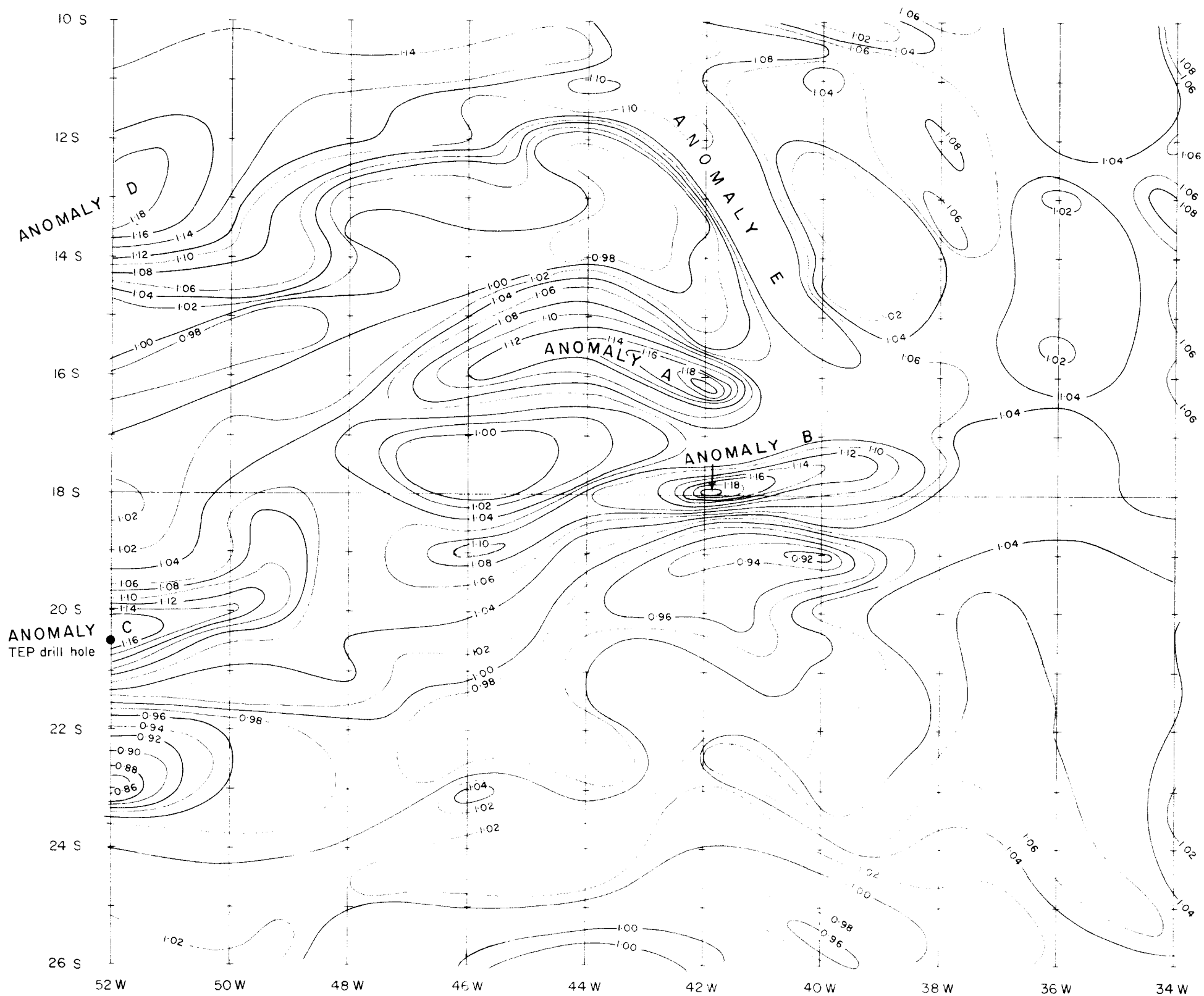
FREQUENCY 1760 c/s COIL SEPARATION 200'

CONTOUR INTERVAL 5%



SCALE IN FEET





GEOPHYSICAL SURVEY IN THE RUM JUNGLE AREA, N.T., 1961

AREA 55 WEST

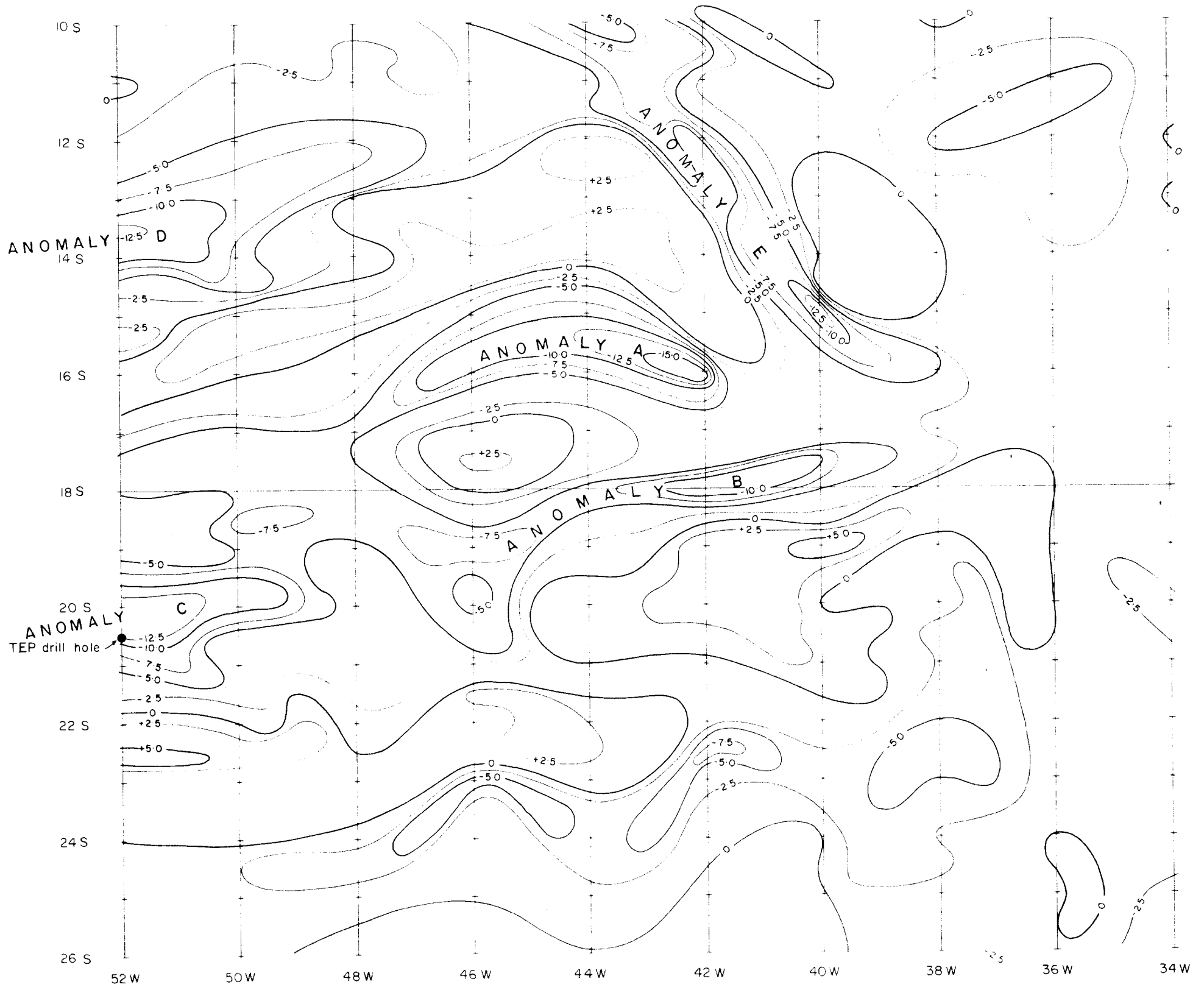
TURAM RATIO CONTOURS

FREQUENCY 440 c/s COIL SEPARATION 50'

CONTOUR INTERVAL 0.02

SCALE IN FEET





GEOPHYSICAL SURVEY IN THE RUM JUNGLE AREA, NT, 1961

AREA 55 WEST

TURAM PHASE CONTOURS

FREQUENCY 440 c/s COIL SEPARATION 50'
CONTOUR INTERVAL 2.5°

