Copy3

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS.

RECORDS
1956, No.59

PRELIMINARY REPORT

on

AEROMAGNETIC SURVEYS FOR IRON ORE IN TASMANIA

by

W.D. PARKINSON

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS.

RECORDS

1956, No.59

PRELIMINARY REPORT

ON

AEROMAGNETIC SURVEYS FOR IRON ORE IN TASMANIA

by

W.D. PARKINSON.

CONTENTS.

ILLUSTRATION.

C O P Y

The report stated that "Two anomalies were recorded on the left bank of the Nelson River about 4 miles from its mouth." The map shows that one of these anomalies, whilst extending across the river, is actually centred on the right (northern) bank. The reason for this apparently erroneous statement is that the positions of the anomalies as quoted in the preliminary report were derived from check points only, without the aid of strip photography. The possible error in estimating positions from check points is greater than the distance from the centre of the anomaly to the river (about 1/5 mile).

The report refers to an anomaly just off the coast north of Sundown Point. The reason why this anomaly is not shown on the map is that the aircraft usually goes at least a mile past the end of one flight line before turning on to the next, and the anomaly was presumably recorded during such a turn. Contours are plotted only up to the ends of the flight lines.

1. GENERAL.

Aeromagnetic surveys were made over three small areas in north-western Tasmania by aircraft VH-MIN between 30th April and 4th May, 1956. They were made as a result of an application by the Director of Mines, Hobart, and the areas were suggested by him. Details of localities and a preliminary account of the results are given below.

2. OPERATIONS.

The three areas were surveyed on flight lines at half-mile separation and running approximately east and west. The system of gridding was closed by flying a tie system on the western and eastern sides of each area. Control of altitude was difficult because of the rough terrain, but the height above ground was kept between 500 and 1000 feet wherever possible. No attempt was made to follow the topography when flying across narrow river gorges which are common in all areas. Aerial photographs were used for navigation.

The party engaged on the surveys consisted of Dr.W.D.Parkinson, Senior Geophysicist in charge of the party, and Messrs. F.J.Merrick, A.Turpie and W.A.Irving of B.M.R., and Captain K.Duffield, F/O K.Worley and Flight Engineer A.M.Kean of T.A.A.

3. INSTRUMENTS.

The total intensity of the magnetic field was measured continuously over flight lines and tie lines with an AN/ASQ-1 fluxgate magnetometer, and was recorded by a Speedomax recorder. A sensitivity of 250 gammas per inch of recorder chart was used except for the central part of the Rio Tinto-Rocky River area for which the sensitivity was reduced to 630 gammas per inch. A test was made for heading error and this was found to have a maximum value of ± 13 gammas without compensation. In view of the low sensitivities used, no compensation was attempted and no corrections need be made.

The height above terrain was continuously recorded by an STR-30A radioaltimeter with an Esterline-Angus recorder. Vertical photography was taken continuously with a strip camera in order to fix the position of flight lines and magnetic features. This film is not available at the time of writing this report so positions referred to below are only approximate.

4. RESULTS.

A sketch map of Tasmania showing the approximate positions of the three areas surveyed is given in Plate 1.

(a) Hampshire-Blythe River: The area surveyed extends from the coastline between Burnie and Penguin in a south-westerly direction to latitude 41° 15' i.e. about a mile north of the town of Hampshire. The area covered by the city of Burnie itself was not surveyed.

Flight lines were directed approximately east and west at half-mile spacing. The terrain consists mainly of a low plateau with narrow river gorges cut into it. A height of 500 feet above the plateau was maintained by the aircraft during the survey.

Apart from the northernmost mile or two, the entire area is magnetically disturbed. The most conspicuous features are a large dome of increased magnetic field

...../2

intensity in the eastern part of the area, and a series of sharp anomalies in the south-west corner. The "dome" is roughly circular with a diameter of about 8 miles. It is centred between Natone and Camena. The amplitude of this rather large-scale feature is about 1000 gammas above the level of the undisturbed field. Superimposed on this are several sharp anomalies, of the order of one mile in linear dimensions. These appear to be of restricted extent, since they rarely appear on successive flight lines. The largest of them is about 1300 gammas above the field in the immediate vicinity and it is about half a mile across. It appears to coincide with a known deposit of iron ore about a mile south-west of Cuprona.

In the south-west of the area, an anomaly appears on every flight line. The indications form a continuous line roughly following the Emu Bay Railway from just north of Hampshire to Highclere. Their amplitudes vary from 500 to 1000 gamma and their widths from half a mile to a mile and a half.

(b) Nelson River: This area extends from parallel 41° 05' S to 41° 13' S and from meridian 144°49~~53~~' E to the coast. It is on the north-west coast of Tasmania, just south of the mouth of the Arthur River. It was surveyed by east and west flight lines spaced half a mile apart, and by two tie systems, one near the coast and one near the eastern edge. The terrain is generally fairly flat, except in the east where river valleys are a few hundred feet deep. Most of the area is heavily timbered. Flight lines were surveyed at a height of 500 feet above terrain, except that no attempt was made to allow for narrow river valleys. The area, in general, is magnetically quiet. An anomaly in the south-east corner of the area, i.e. about 6 miles east of Temma, has an amplitude of some 300 gammas. Two anomalies were recorded on the left bank of the Nelson River about 4 miles from its mouth. They are a mile apart and of amplitude 200 and 250 gammas. However, they were not recorded on the two intermediate flight lines. The only other anomaly recorded is just off the coast north of Sundown Point. None of the anomalies is of a significant amplitude.

(c) Rio Tinto-Rocky River: A rectangular area about 11 miles by 24 miles was designated for survey. It is bounded by parallels 41° 23' S and 41° 45' S and meridians 144° 44' E and 144° 53' E, i.e. roughly between the Savage and Pieman Rivers stretching eastward to the Meredith Range. The country is very rough topographically, with many river gorges several hundred feet in depth. Much of it, particularly the low-lying part, is heavily timbered.

The area was surveyed on east and west flight lines at half-mile spacing, and these were controlled by two tie systems along the eastern and western edges of the area. Generally the height above terrain was between 500 and 1000 feet, but it was not possible to keep the aircraft at a constant height above the ground. In the central part of the area, in which the flight lines cross the northern part of the Meredith Range, every flight line was flown in a westerly direction, so that the

...../3

aircraft could fly downhill rather than uphill. The south-east corner of the area was not surveyed, because the topography was too rough for safe flying at a reasonable altitude. The southern flight lines were extended for some distance to the west because an anomaly was recorded on the extreme south-western part of the area.

Most of the recorded magnetic anomalies lie on a broad band running from north-east to south-west following roughly the Waratah-Corinna road and its extension to the south-west. Some groups of these anomalies lie on lines which cross several adjacent flight lines. The largest anomaly in this group has a total intensity rising to almost 18,000 gammas above the normal field.

Another group of anomalies was recorded near the Rocky River, but in the most intense of these the field rises to only 3,500 gammas above normal. In the extreme south-west of the area is an extensive anomaly with maxima up to 1,300 gammas above normal. This anomaly extends almost to the coast.

5. CONCLUSIONS.

The survey has revealed some small but very intense anomalies in the Rio Tinto-Rocky River area but the nature of these will not be known until the final map of total magnetic intensity has been prepared. There is an interesting pattern of magnetic field variations in the Hampshire-Blythe River area which will assist in the interpretation of the geology of that area and may possibly indicate the presence of additional small iron-ore deposits. No anomalies of any significance were recorded in the Nelson River area.

The reduction of the results and the preparation of appropriate maps will be undertaken by the B.M.R. Reductions Group shortly.

PLATE I

AEROMAGNETIC SURVEYS FOR IRON ORE IN TASMANIA

145° 146° 147° 148°

40°

FLINDERS ISLAND

SCALE IN MILES

16 0 16 32 48

41° NELSON RIVER AREA

HAMPSHIRE-BLYTHE RIVER AREA

BURNIE

DEVONPORT

Arthur River

RIO TINTO-ROCKY RIVER AREA

LAUNCESTON

South Esk River

Pieman River

ZEEHAN

42°

QUEENSTOWN

Gordon River

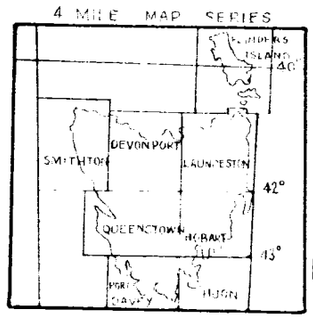
Derwent River

HOBART

Huon River

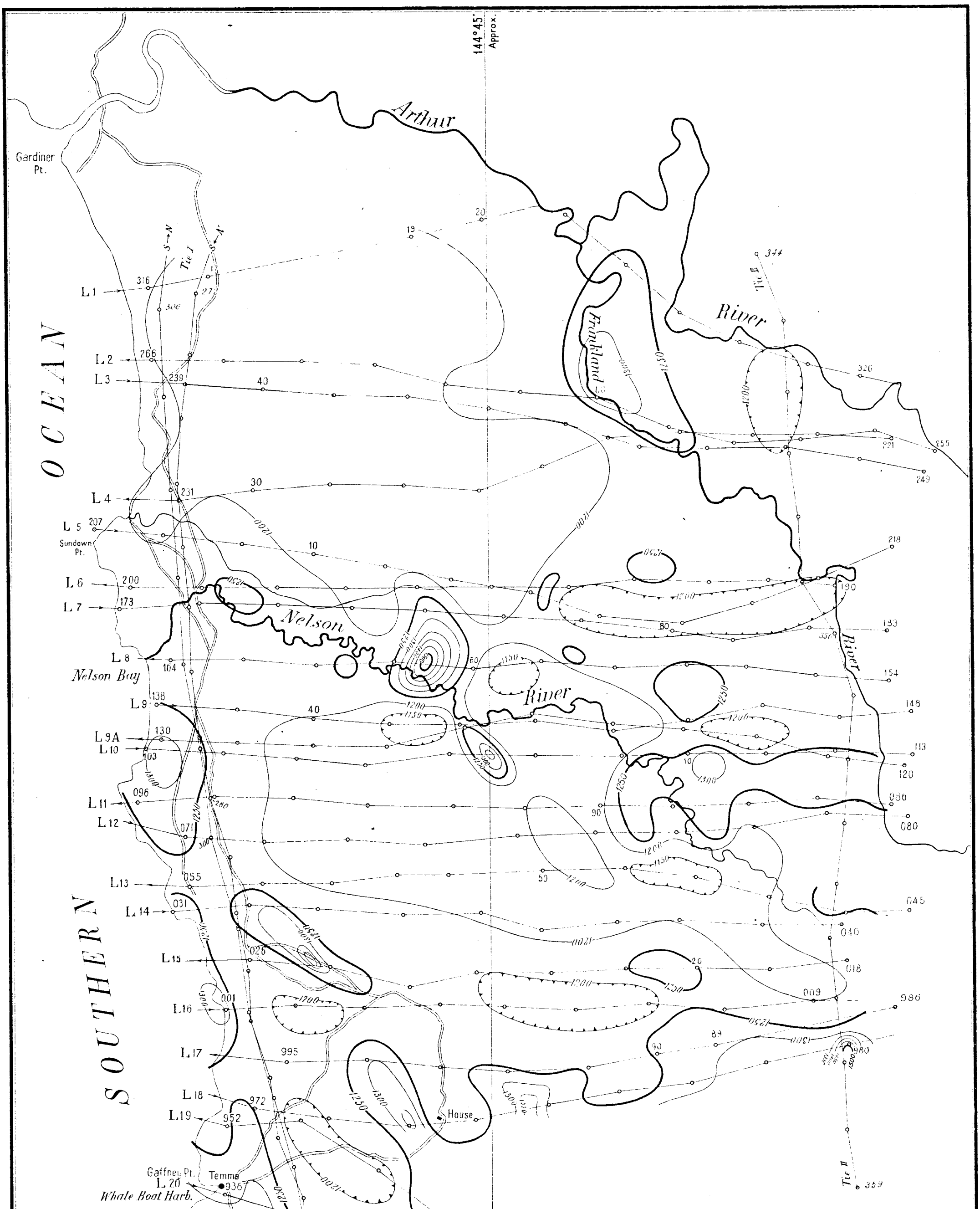
43°

4 MILE MAP SERIES

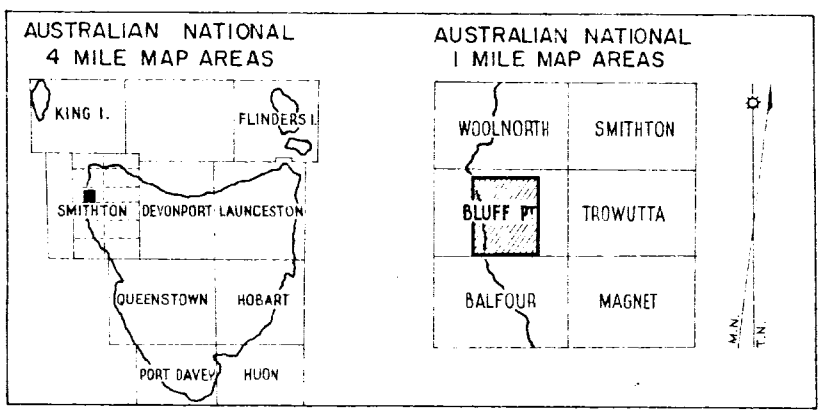


514

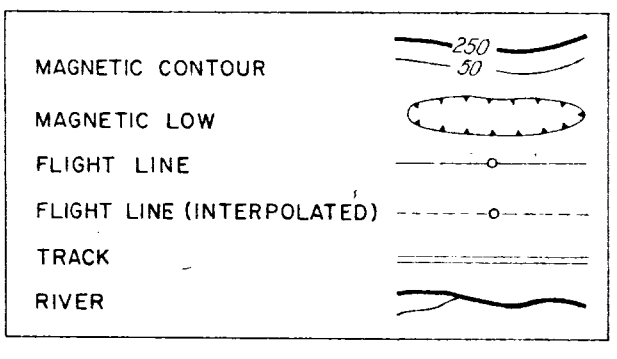
TASMANIA
NELSON RIVER DISTRICT



LOCATION DIAGRAM

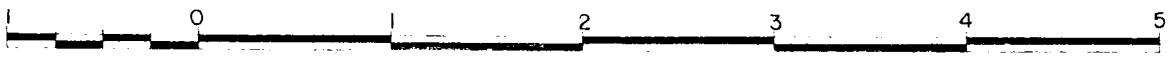


LEGEND



Compiled and drawn by Geophysical Section,
Bureau of Mineral Resources, Geology and Geophysics.
Department of National Development, Melbourne.

APPROXIMATE SCALE IN MILES



CONTOUR INTERVAL 50 GAMMAS

AEROMAGNETIC MAP OF TOTAL INTENSITY

NELSON RIVER DISTRICT, TASMANIA

EXPLANATORY NOTES

This map was compiled from the results of an airborne magnetometer survey conducted by the Bureau of Mineral Resources in May, 1956 over a selected area in the Nelson River District, Tasmania.

The object of the survey was to delineate magnetic anomalies to assist in the search for iron ore deposits.

The data remain uncorrected for a regional gradient in total field intensity of 5·6 γ per mile in a direction S. 19° W.

The total field intensity was continuously recorded by an AN/ASQ-1 airborne magnetometer installed in a D.C.3 aircraft. The survey was made at an altitude of 500 feet above ground level along lines spaced nominally one half mile apart.

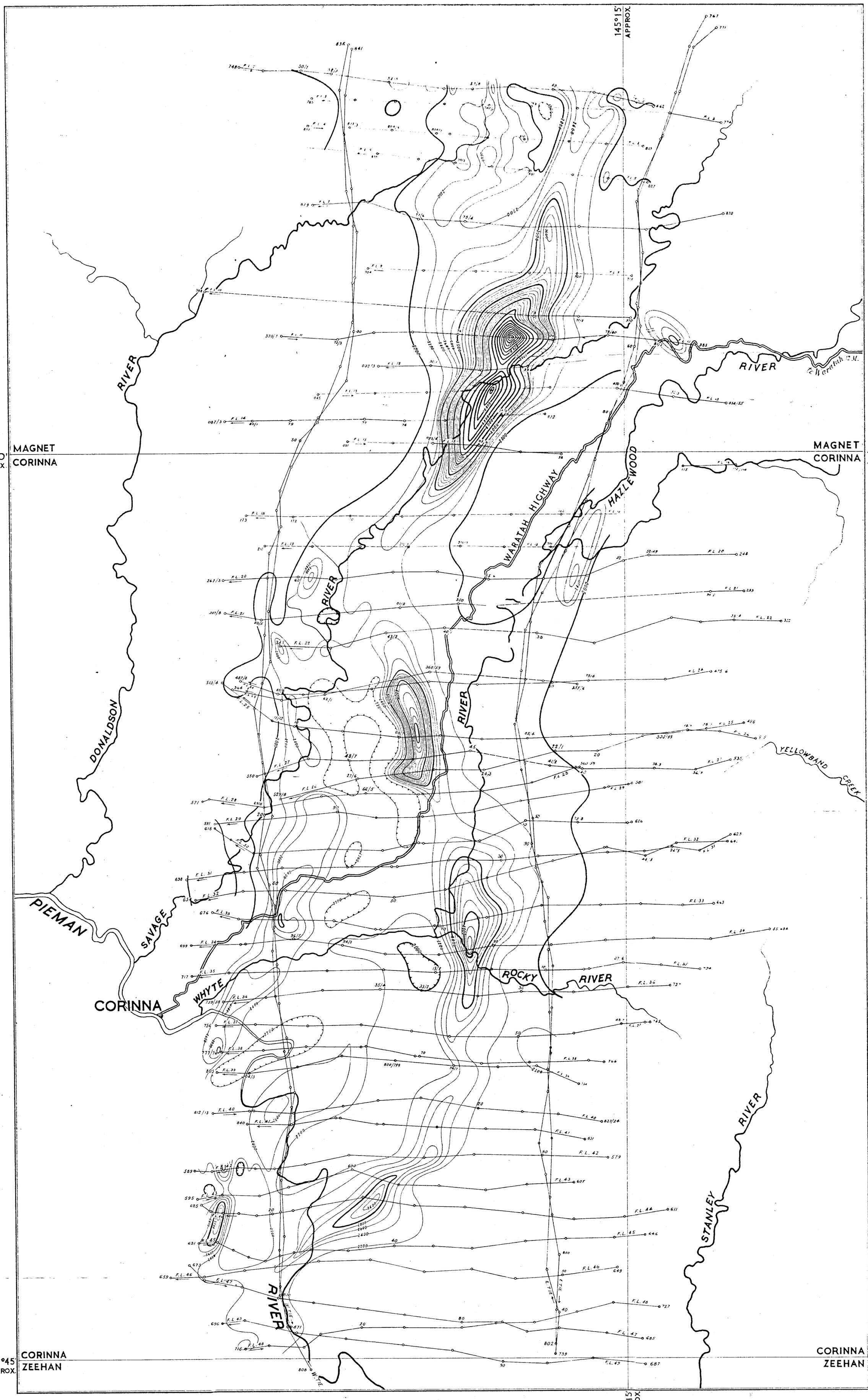
Photo mosaic assemblies were used as a visual aid to navigation. The actual flight path of the aircraft was plotted from continuous strip photography taken with a 35 mm. camera during flight. Planimetric detail was compiled from an uncontrolled photo mosaic at an approximate scale of one inch to one mile.

G 264-1

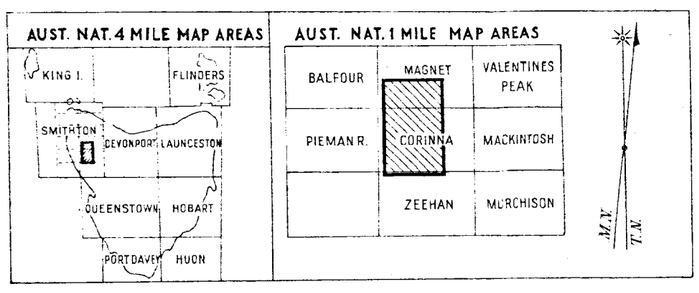
TASMANIA

ROCKY RIVER - RIO TINTO DISTRICT

PARTS OF MAGNET, CORINNA AND ZEEHAN 1 MILE MAPS



LOCATION DIAGRAM



LEGEND

MAGNETIC CONTOURS 1000 200

MAGNETIC LOW

FLIGHT LINE

FLIGHT LINE (INTERPOLATED)

ROAD

TRACK

RIVER

APPROXIMATE SCALE IN MILES

1 0 1 2 3 4 5

CONTOUR INTERVAL 200 GAMMAS

AEROMAGNETIC MAP OF TOTAL INTENSITY

ROCKY RIVER-RIO TINTO DISTRICT

EXPLANATION

This map was compiled from the results of an airborne magnetometer survey of selected areas in the Rocky River - Rio Tinto district, Tasmania, conducted by the Bureau of Mineral Resources in May, 1956. The object of the survey was to delineate magnetic anomalies showing the extent and distribution of probable iron ore deposits.

The data remain uncorrected for regional gradient in total field intensity of 5·6 γ in a direction of S 19° W

The total intensity was continuously recorded by an airborne magnetometer. The survey was made at an altitude of 500 feet above ground level along lines spaced one half-mile apart.

Photo mosaic assemblies were used as a visual aid to navigation. The actual flight path of the aircraft was plotted from 35 mm. continuous strip photography of the ground taken during flight.

GEOPHYSICAL SECTION, BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

G 252-1