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RECORD No. 1962/35



HEAZLEWOOD MAGNETIC SURVEY, TASMANIA 1960

by

J. Horvath and E.C.E. Sedmik

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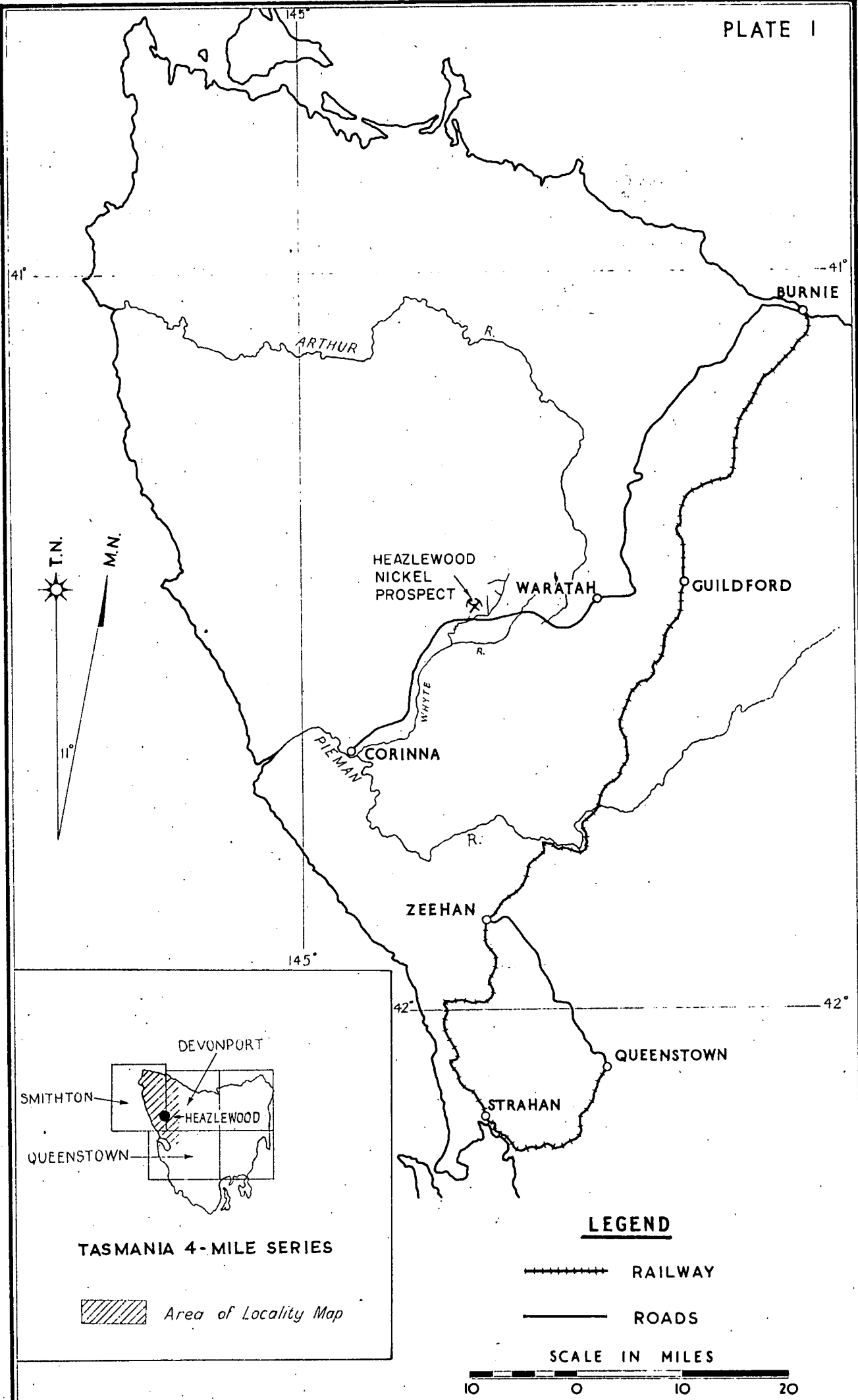
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GEOPHYSICAL INVESTIGATIONS AT HEAZLEWOOD  
NICKEL PROSPECT, NEAR WARATAH, TASMANIA  
**LOCALITY MAP**

G 417-1

*Geophysical Branch, Bureau of Mineral Resources, Geology & Geophysics.*

HEAZLEWOOD, TASMANIA, 1960.

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- Plate 2 Profiles of magnetic vertical intensity and of Magnetic Susceptibility of rock samples, Traverses 100N and 00. (G417-2).
- Plate 3 Sketch map showing magnetically disturbed areas and previous exploration work (G417-3).

## SUMMARY

A magnetic survey was made over a small area surrounding the Lord Brassey nickel prospect near Waratah, Tasmania. The nickel occurs in serpentized parts of a rather extensive area of basic and ultrabasic rocks.

The main nickel mineral is a nickel sulphide closely associated with magnetite. It was thought that a magnetic survey might outline zones of higher magnetite concentration and so point to the occurrence of the nickel.

The magnetic survey revealed some zones of magnetic anomalies and some areas which are magnetically less disturbed. It is believed that the nickel mainly occurs within the magnetically disturbed areas.

## 1. INTRODUCTION

The Heazlewood mining area is about 16 miles west of Waratah, and about 1 mile north-east of the bridge over the Heazlewood River, on the Waratah-Corinna road (Plate 1). Small amounts of nickel minerals were obtained in the past, but workings have been abandoned for some time. A local syndicate is investigating an area around two old workings, the Lord Brassey mine and Jupps Nickel mine.

At the request of the Tasmanian Department of Mines, a geophysical survey was made over an area including these workings. On geological grounds a large area may be considered favourable for the occurrence of nickel minerals but, as there was no certainty that geophysical methods would assist in prospecting, the survey was envisaged as a test, and confined to a small area. The survey was made by E.C.E. Sedmik and E.N. Eadie, geophysicists, during February and March 1960.

## 2. GEOLOGY

The regional geology of the Heazlewood district has been described by Nye (1923). The geology of the nickel-bearing area has been described by Twelvetrees (1900) and Hughes (1957).

The survey area is in a large complex of basic-ultrabasic rocks, probably of Cambrian age, which occurs between the Precambrian rocks of the Long Plains Series and the Cambrian sediments of the Cleveland/Whyte River district. The basic rocks have been extensively serpentinitized, with much associated shearing. The sheared serpentinite has been mineralized with iron and nickel minerals. The main iron mineral is magnetite. The nickel occurs as the rare minerals zaraitite (hydrated nickel carbonate) in the secondary zone, and heazlewoodite (a nickel sulphide) in the primary zone. Mineragraphic examination has shown that the nickel minerals are always intimately associated with magnetite.

The workings consist of adits and shafts at the Lord Brassey and Jupps Nickel mines, and several costeans. The Lord Brassey adit has recently been cleared out, and plans of the workings are available. No plans of Jupps workings exist; as the workings are inaccessible, there is no information on their extent. The workings, as known, are shown on Plate 3. The mines have produced only small quantities of ore.

## 3. APPLICABILITY OF THE MAGNETIC METHOD

Magnetic anomalies associated with geological formations are generally due in the first instance to the magnetite content of the rocks. It could therefore be expected that magnetic surveys would detect portions of the serpentinite mass that contain exceptionally high concentrations of magnetite. Although it is known that the nickel minerals in the Heazlewood district are closely associated with magnetite, it has not been proved that the magnetite is invariably associated with nickel. As far as is known, the nickel minerals occur only in narrow veins, and there was no reason to expect the presence of a large body which could give rise to a major magnetic anomaly. The most that could be expected of the survey was that it might indicate that certain

portions of the serpentinite have exceptionally high magnetite contents. If a comprehensive programme of sampling and assaying should prove that these portions also contain nickel in economic quantities, full-scale magnetic surveys over the serpentinite would be warranted, to indicate areas of high magnetite content. Such areas would be worthy of close prospecting for nickel.

#### 4. TECHNICAL DETAILS

The area covered by the survey is shown on Plate 3. Measurements of vertical intensity were made along the traverses shown, at stations 25 feet apart, using an A.B.E.M. torsion magnetometer. Hand samples were taken along portions of Traverses 00 and 100N, as close as possible to the observation points, and their susceptibility was later determined in the Geophysical Laboratory.

#### 5. RESULTS

Results of measurements along Traverses 00 and 100N are shown on Plate 2, together with the susceptibility values of the samples. The main features of the results are :

- (a) the anomalies observed are typical of those obtained over erratically magnetized near-surface material. No anomaly that could be caused by a large deep-seated body is present.
- (b) the anomalies are strong, indicating that the susceptibility of the rocks causing them is high.
- (c) the anomalies are confined to well-defined zones along each traverse.
- (d) the susceptibility measurements agree satisfactorily with the magnetic results; some of the susceptibilities measured are high, and samples showing high susceptibility came from portions of the traverses showing strong magnetic anomalies.

The results of measurements on the other traverses are shown on Plate 3, in which the portions of the traverses showing strong anomalies are marked. These define zones of considerable area, in which it may be concluded that the magnetite content is high.

#### 6. CONCLUSIONS AND RECOMMENDATIONS

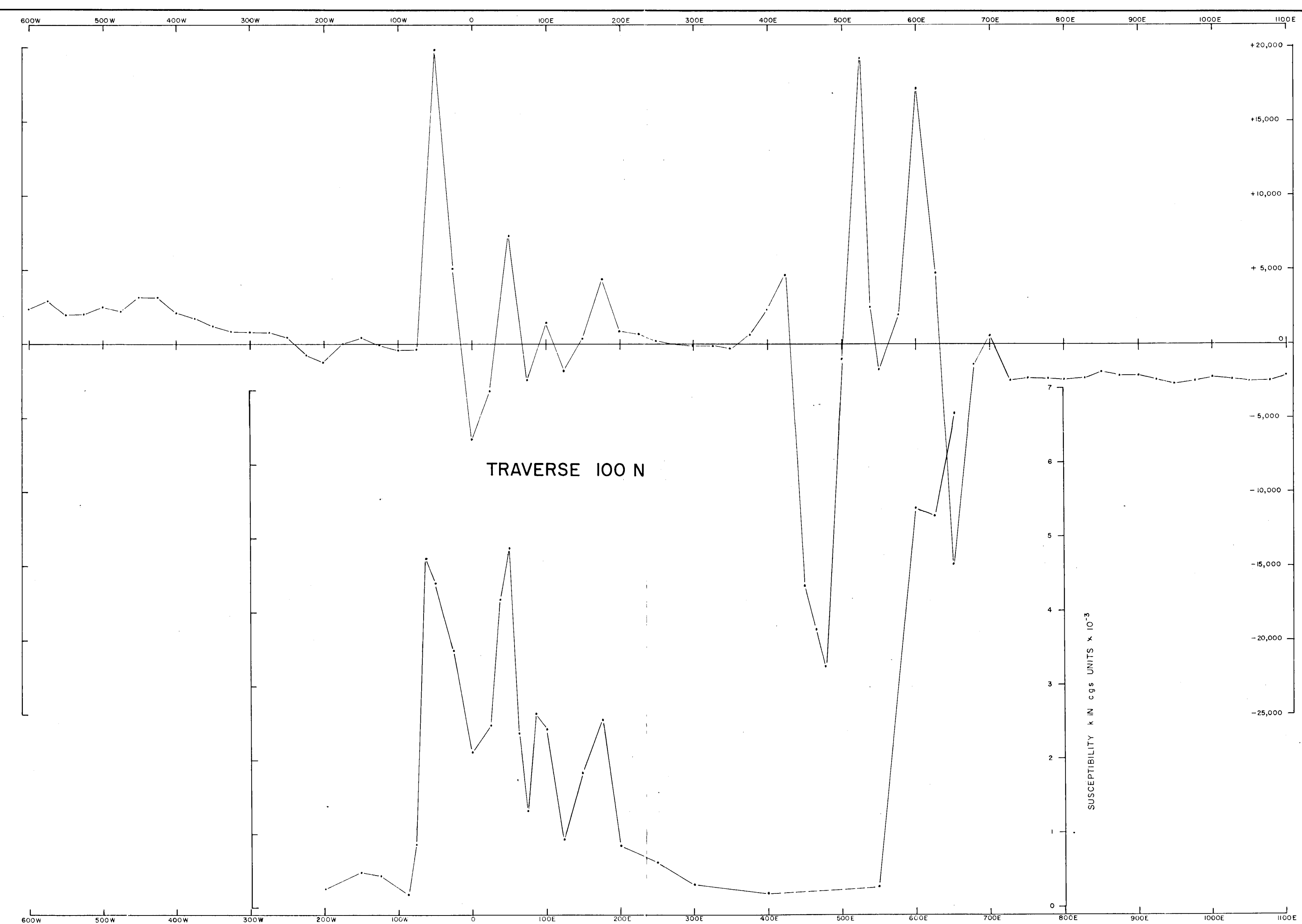
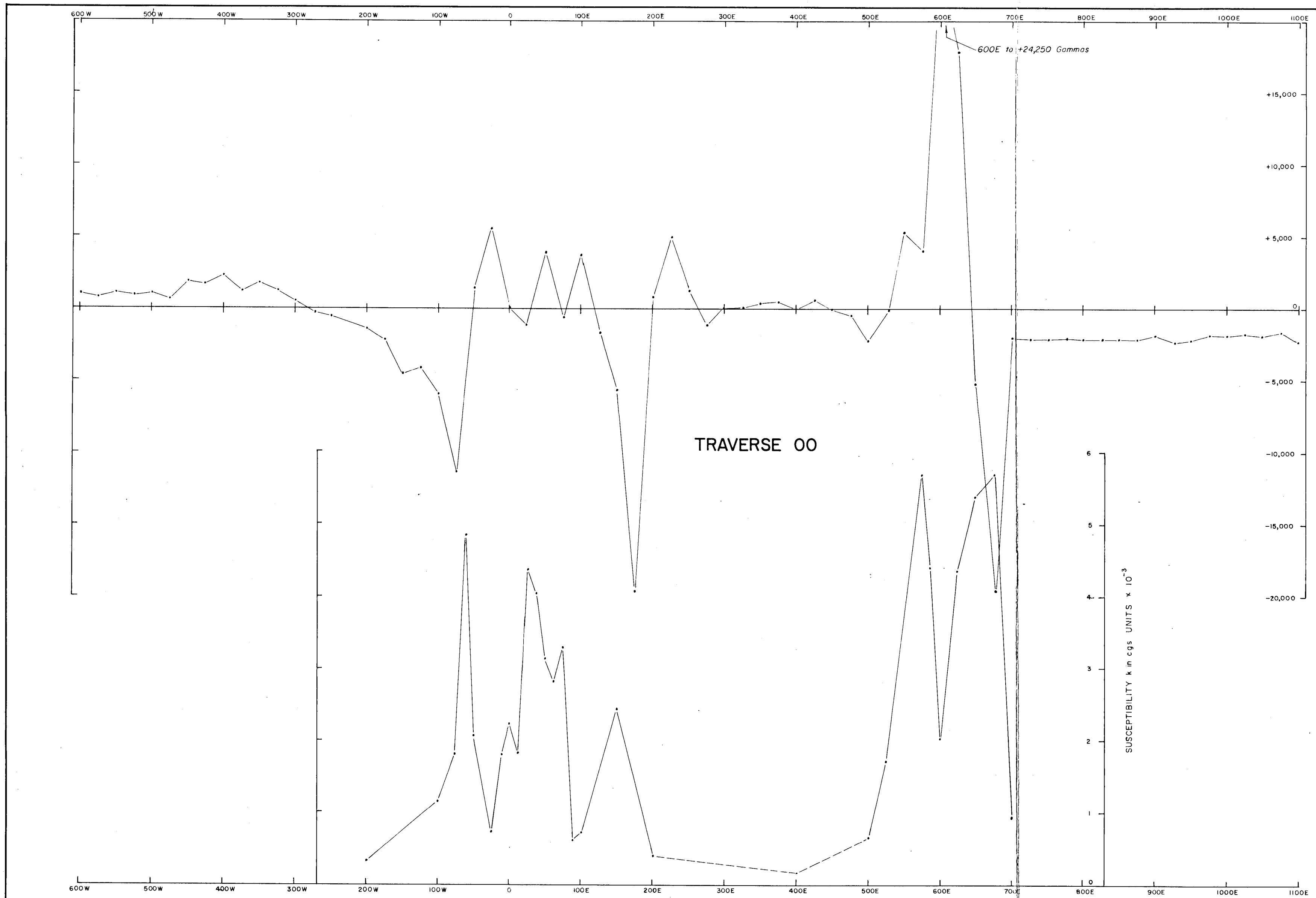
- (1) The results show no anomalies caused by large magnetic bodies that might be worth drilling as possible orebodies.
- (2) The survey has delineated several zones whose combined area is approximately half the survey area, and which contain considerably more magnetite than the remainder of the area. The known nickel mineralization appears to occur in these zones.

It appears that the possibility of the magnetic method being a useful aid in prospecting in this area depends entirely on the mode of occurrence of the nickel. The only result of the magnetic survey has been to indicate certain zones of considerable extent as possibly favourable for the occurrence of nickel minerals. If minerals of economic value are confined to narrow veins, these zones must be prospected in detail and it cannot be claimed that the geophysical survey has been of great value. If, however, nickel mineralization is disseminated through the magnetic zones sufficiently to form lowgrade orebodies which could be mined on a large scale, there would be a basis for recommending systematic sampling of the magnetic zones, and extension of the magnetic survey to cover the whole serpentized area. There is no evidence that this is the case, but it is not known whether the deposits have been examined from this point of view. The Lord Brassey workings are almost entirely included in a magnetic zone, and provide a favourable opportunity for testing. It is recommended that these workings be examined systematically for the presence of nickel minerals, and, if it appears warranted, a programme of systematic sampling and assaying should be arranged. If this testing shows that economic mineralization is confined to small sections, no further testing of the survey results is warranted, nor is there any justification for recommending further magnetic surveys in the area.

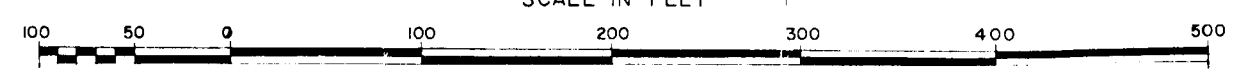
#### 7. REFERENCES

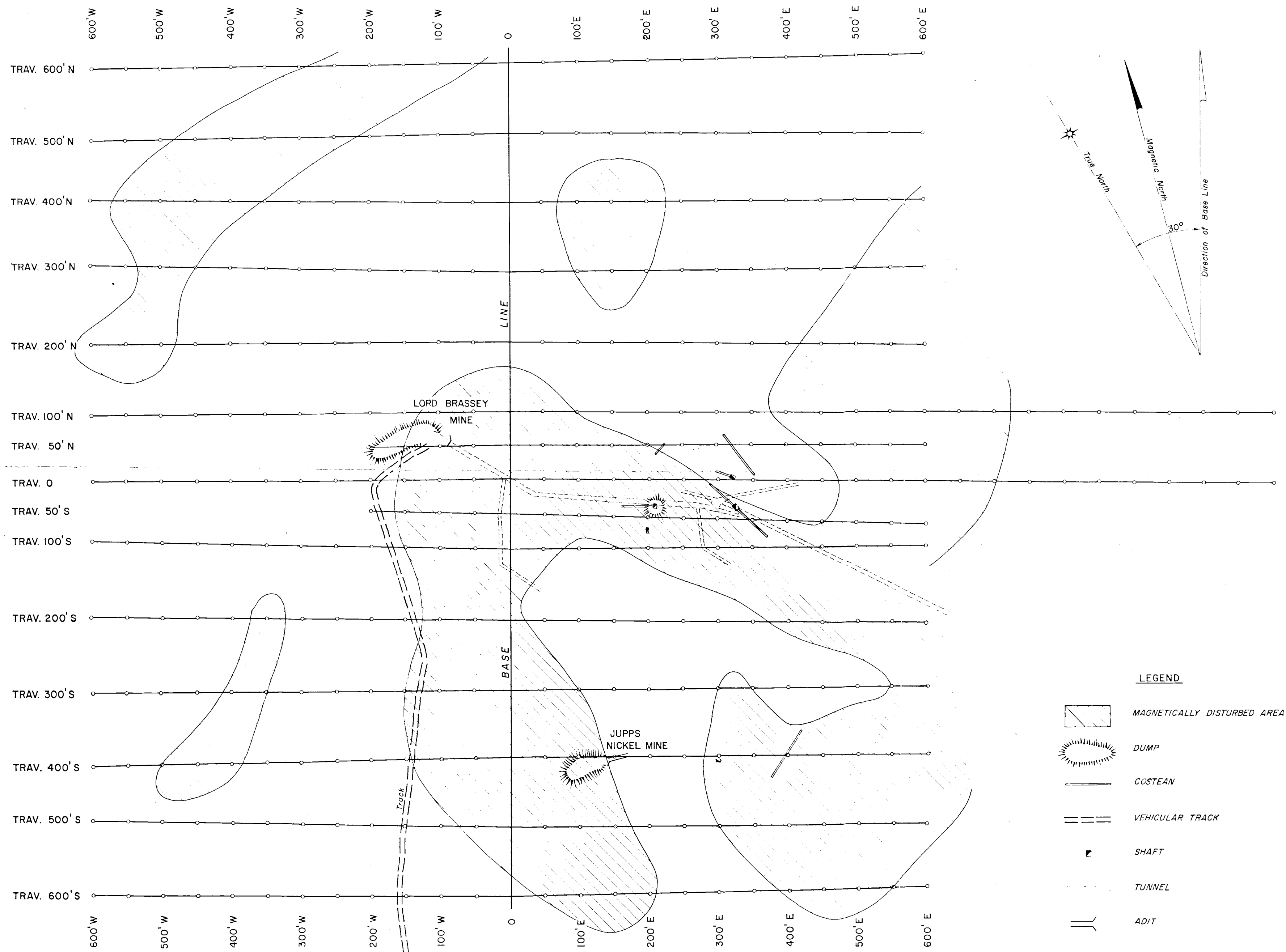
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HEAZLEWOOD WARATAH, TAS. 1960  
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HEAZLEWOOD NICKEL PROSPECT, NEAR WARATAH, TAS.  
TRAVERSES 00 AND 100N  
PROFILES OF MAGNETIC INTENSITY AND SUSCEPTIBILITY  
OF ROCK SAMPLES TAKEN ALONG GRID  
SCALE IN FEET





GEOPHYSICAL SURVEY AT HEAZLEWOOD  
NEAR WARATAH, TASMANIA.  
NICKEL PROSPECTING AREA  
SKETCH MAP SHOWING  
MAGNETICALLY DISTURBED AREAS IN RELATION  
TO PREVIOUS EXPLORATION WORK

