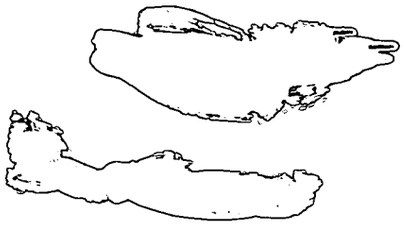

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

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RECORDS 1953, No. 53

THIRD PROGRESS REPORT OF THE GEOPHYSICAL SURVEY OF THE RENISON BELL TIN FIELD, TASMANIA

by

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C O N T E N T S.

I L L U S T R A T I O N S

ABSTRACT

Results are given of geophysical work done during 1952 at the Renison Bell tin field, Tasmania. The area surveyed is to the immediate south-east of those surveyed in 1950 and 1951 and includes the Federal open-cut, Dunn's workings and Stebbins Hill. Self-potential and magnetic methods, which had proved satisfactory in the previous surveys were again used.

Of five main anomalies which were found, three coincide with known workings, namely the Federal open-cut, Dunn's workings and Montana South workings. These anomalies do not indicate any considerable extension of the ore bodies already worked. Of the other two anomalies, one is slightly north-west of Dunn's workings and the other directly on Stebbin's Hill. Three drilling sites are recommended for testing these two anomalies.

1. INTRODUCTION.

Two earlier reports (Williams, 1950 and Loh, 1951) describe the geophysical surveys made in 1950 and 1951 at the Renison Bell tin field. As the zone of mineralisation covers a large area, it was considered desirable to continue the survey in 1952. The present report describes the work done during the 1952 field season.

The area surveyed is situated to the south-east of those surveyed during 1950 and 1951, and includes the Federal open-cut on Stebbins Hill and the Montana South and Dunn's workings to the west and south-west of Stebbins Hill respectively (see Plate 1). An auxiliary base line at 2000.E, on a true bearing of 337°, was used in the previous surveys, and this was continued southward for the present work. Traverses 100 feet apart, at right-angles to the base line, were pegged with stations at 25-foot intervals from the eastern end of the traverses surveyed in 1951 to 3000.E, which is near the Boulder tramway, well down the eastern slope of Stebbins Hill.

The area surveyed covers part of an area already surveyed by the I.G.E.S. in 1928, but as the I.G.E.S. survey was more in the nature of an experimental test, and as the methods used were different, the results of that survey could not be used in drawing the contour maps contained in the present report.

The self-potential and magnetic methods, which were used in the 1950 and 1951 surveys and which proved suitable for the area, were again used. The methods are described by Williams (1950).

The survey was made between February and May, 1952 by a party comprising O. Keunecke (party leader), A.F. Alle (Geophysicist) and P. Tenni and M. O'Connor (cadet geophysicists). Assistance was given during the first part of the survey by two university vacation students and later by two field assistants provided by Renison Associated Tin Mines, N.L. Progress was very slow and tedious, as the area is mountainous and thickly timbered, and considerable time was spent in clearing and pegging the traverses.

2. GEOLOGY.

The Renison Bell field forms the major portion of the North Dundas tin field. The geology of the area is described in reports by Ward (1909), Fisher (1943) and Fisher (1953, pp. 1179-84).

The country rock of the field consists of Cambro-Ordovician slates and grits, referred to under the general name of "Dundas slates". These have been intruded by igneous rocks of types ranging from acid (quartz porphyries) to ultrabasic (pyroxenites and serpentines). The ore bodies consist mainly of pyrite and pyrrhotite, and contain very fine tin minerals. They also contain magnetite, some siderite, and quartz. They occur as steeply-dipping fissure lodes, and as flat irregular sills between the bedding planes of the slates.

In the area covered by the present survey, the igneous intrusives are represented by a dolerite dyke, which lies almost parallel to the base line, about 200 feet west of it.

3. DISCUSSION OF RESULTS.

A description of the methods used was given in the first progress report (Williams, 1950) and is not repeated here.

The results of the self-potential survey are shown as profiles on Plate 2 and as contours on Plate 3. Profiles and contour map show that the self-potential anomalies vary widely in size, shape and strike. As it has already been proved that the indications obtained on the Renison Bell field are caused generally by pyrite and pyrrhotite bodies, it would be interesting to predict more accurately the size and shape of the ore bodies. Unfortunately, such predictions can only be made on bodies of simple geometrical shapes. The ore bodies of the Renison Bell field are irregular and no simple approximation to their shape is possible. However, a study of the contour map gives a rough indication of the outline of the ore body concerned. At the Federal open-cut, for example, it should be noted how the self-potential contours closely resemble the shape of the ore body.

The magnetic vertical force intensities are shown as profiles on Plate 4 and as contours on Plate 5.

In general, there are fewer anomalies than in the area of the Renison Bell lode, but most of the anomalies shown are well pronounced. They are of considerable extent, particularly in the eastern portion. The anomalies have been numbered, the numbers following on from those used in the previous reports. In the newly-surveyed area, five anomalous areas can be seen, three of which correspond with known workings, namely No. XXIII with the Federal open-cut, XXV with Dunn's workings, and XXVII with Montana South workings. Thus only two anomalies (XXIV and XXVI) are not accounted for by known orebodies.

No. XXIII. This anomaly coincides with the Federal open-cut, the northern part of which had been previously surveyed (Loh, 1951). The intensity of both self-potential and magnetic anomalies decreases sharply south of Traverse 2400S, thus indicating that the lode terminates near this traverse.

No. XXIV. This indication is very well-defined and extensive on the self-potential map, but appears only as a very weak, local anomaly on the magnetic map. The self-potential anomaly starts at 2350E on Traverse 2600S, increases rapidly to Traverse 2700S and continues at almost undiminished strength to the southern-most traverse surveyed (3200S.). The profiles indicate the source to be nearest the surface at 2325E on Traverse 2700S, while further south the anomaly originates from a greater depth. The anomaly extends over most of the eastern portion of the profiles and suggests a westerly dip of the mineralised body. The indication strikes slightly west of north and is situated directly on Stebbins Hill.

The weak magnetic anomaly is confined to Traverse 2800S, the traverses to the immediate north and south showing ill-defined variations in the magnetic vertical intensity. As the magnetic anomalies are caused mainly by magnetite and pyrrhotite, these two minerals must be absent or present in only small amounts in this region.

The extent and strength of the self-potential anomaly warrants further investigation. It is suggested that the anomaly be tested by 2 drill holes, the positions of which are shown on Plate 3. Drill hole G23 is suggested at 2275E

on Traverse 2700S, at an angle of depression of 45°, on a true bearing of 67°, i.e. in the direction of the traverse. It is recommended that the second drill hole, G24, be a vertical one at 2315E on Traverse 3100S.

No. XXV. This anomaly, which corresponds with Dunn's workings, is well-defined on both the self-potential and magnetic contour maps. Indications are that the lode does not extend much beyond the northern end of Dunn's workings, but the survey did not extend sufficiently far south to show the extent of the ore body in that direction.

No. XXVI. This anomaly is slightly north-west of Dunn's workings, from which it extends for several hundred feet. It is a well-defined, rather narrow feature, striking approximately north, but the self-potential values are not as high as those of the other anomalies. A well-defined magnetic anomaly, with a maximum value of about 2,500 gammas coincides with the position of the self-potential indication. The indication is not deep-seated and could be checked by a diamond drill hole of 100 to 150 feet depth. A suggested site for this hole (G25) is shown on Plate 3 at 1550E on Traverse 2700S. The hole should be depressed at 45°, on a bearing of 67° (true).

No. XXVII. This anomalous area covers the extensive Montana South workings. The geophysical profiles are very irregular and show several negative self-potential centres and magnetic highs. The anomalies are so close together that they are best combined into one anomalous area. A remarkable feature of the self-potential results is the way in which three well-defined minima in the usual direction of strike indicate a controlling geological pattern which appears to be at variance with that suggested by the surface workings. The anomalies suggest the presence of three narrow mineralised zones which may be obscured in the zone of weathering. As the survey did not cover the whole of the Montana South workings, no indication can be given of the full extent of the ore body, particularly to the south.

4. CONCLUSIONS.

The survey revealed five areas showing self-potential and magnetic anomalies. These anomalies indicate the possible presence of mineralised bodies of the type known from previous workings. Three of the anomalous areas coincide with present workings, and the other two do not agree in position with any known ore bodies.

The survey confirmed the outline of the Federal ore body to the extent already worked, and indicated only a short extension south-eastwards.

The maxima of two of the geophysical anomalies coincide with Dunn's workings and Montana South workings. At the latter workings the results indicate three north-west striking narrow mineralised zones. Near Dunn's workings, there is a northern, less pronounced extension of the anomaly which should be tested by drilling at 1550E on Traverse 2700S.

In addition, a well-pronounced, extensive, but more deep-seated self-potential anomaly, not coinciding with any known lode, was recorded on Stebbins Hill, and should be tested by at least two diamond drill holes at 2275E on Traverse 2700S and at 2315E on Traverse 3100S.

5. REFERENCES.

Fisher, N.H., 1943 - Geological Report on the Renison Bell Tin Field. Miner.Res.Surv. Branch, Report No. 1943/23.

Fisher, N.H., 1953 - GEOLOGY OF AUSTRALIAN ORE DEPOSITS. Aust.Inst.Min.Met., Melbourne.

Loh, R.P., 1951 - Second Progress Report of the Geophysical Survey, Renison Bell Tin Field, Tasmania. Bur.Min.Res.Geol. & Geophys., Records 1951, No.42.

Ward, L. Keith, 1909 - The Tin Field of North Dundas. Geol. Surv. Tas., Bull.6.

Williams, L.W., 1950 - Progress Report, Geophysical Survey, Renison Bell, Tasmania. Bur.Min.Res. Geol. & Geophys., Records 1950, No.41.

PLATE I

EMU BAY RAILWAY 3'6" GAUGE

STATION

TOWNSHIP

POST OFFICE

BOULDER

Argent Crk.

RAILWAY TO ZEEHAN

MILL

ROAD

Renison Bell Crk.

TRAMWAY

DREADNOUGHT HILL

MONTANA NORTH

REPORT 1

REPORT 2

RENISON BELL HILL

FEDERAL CUT

2100S
2200S
2300S
2400S
2500S
2600S
2700S
2800S
2900S
3000S
3100S
3200S

STEBBINS HILL

REPORT 3

1100

MONTANA SOUTH WORKINGS

DUNNS WORKINGS

1000E

3000E

1000

I.G.E.S. SURVEY 1929

900

800

700

2' GAUGE

Dreadnought Creek

Montana Crk.

Dalcoath Creek

23°

True North

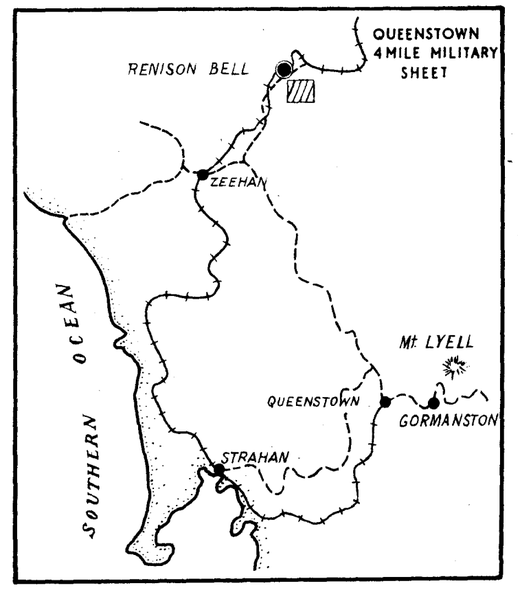
10°

Magnetic North

Grid

COMMONWEALTH HILL
APPROX. 8,300S.
1,150W

PINE HILL
APPROX. 9,100S
200E



LOCALITY MAP

Scale approx: 8 MILES TO 1 INCH
Reference to Australian Survey 1" = 253,440
Queenstown K 55/9 and 10 Zone 7

LEGEND

REPORT 3 — Area described in previous reports

800' — Surface contours

Area covered by mine workings

Sgd. Kosmath

GEOPHYSICIST

SCALE IN FEET

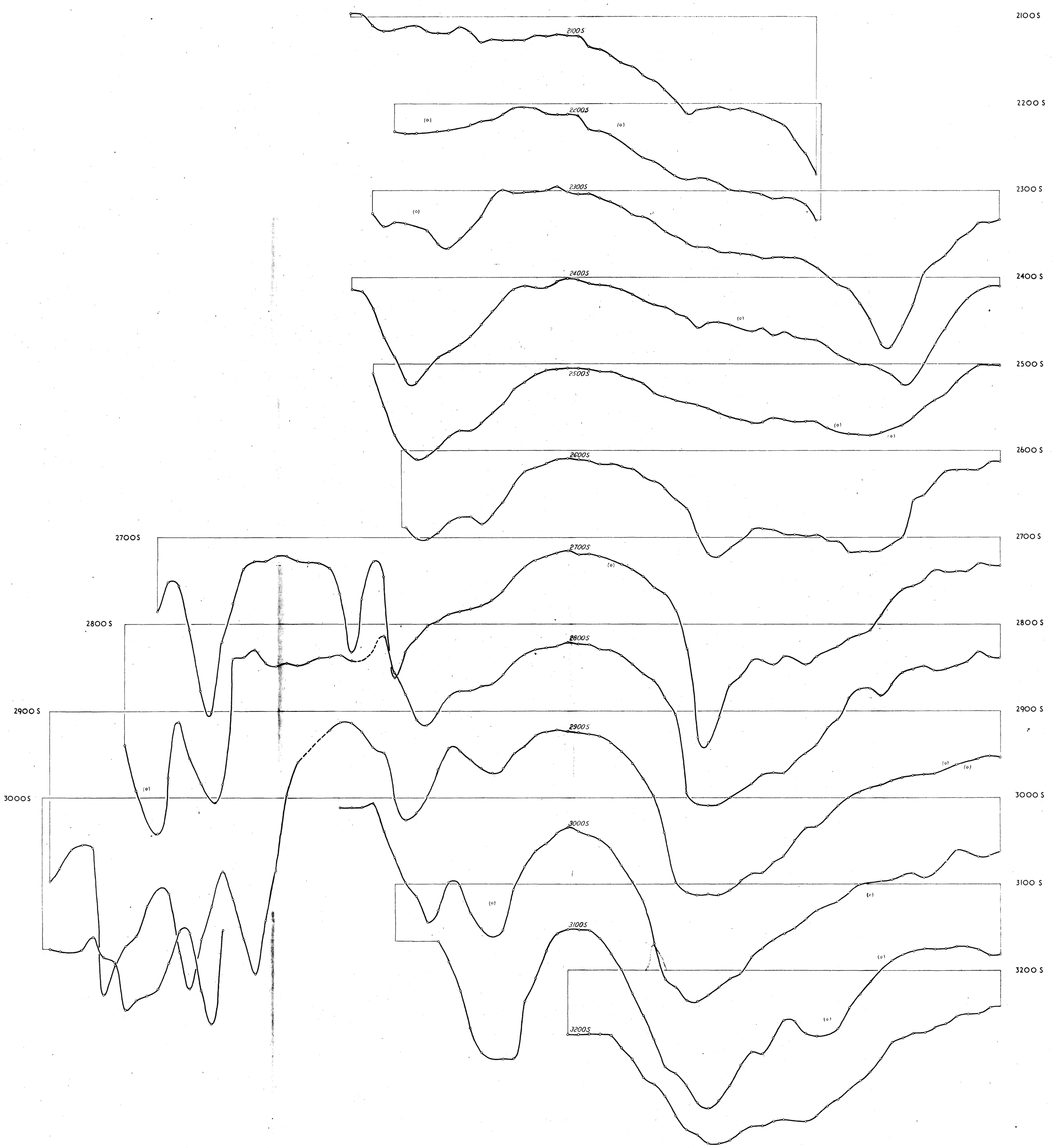
400 0 400 800 1200 1600

THIRD PROGRESS REPORT ON GEOPHYSICAL SURVEY OF RENISON BELL TIN FIELD, TASMANIA

LOCALITY PLAN OF MINE LEASES AND AREAS SURVEYED

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics G86-11

PLATE 2



SCALES

HORIZONTAL 100 0 100 200 300 400 500 FEET

VERTICAL 100 0 100 200 300 400 500 MILLIVOLTS

GEOPHYSICAL SURVEY

RENISON BELL TIN FIELD, TASMANIA

SELF-POTENTIAL PROFILES

STEBBINS HILL SECTION

J. Martin GEOPHYSICIST

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics

G 86-15

PLATE 3

SCALE

100 0 100 200 300 400 FEET

GEOPHYSICAL SURVEY

RENISON BELL TIN FIELD, TASMANIA

SELF-POTENTIAL CONTOURS

STEBBINS HILL SECTION

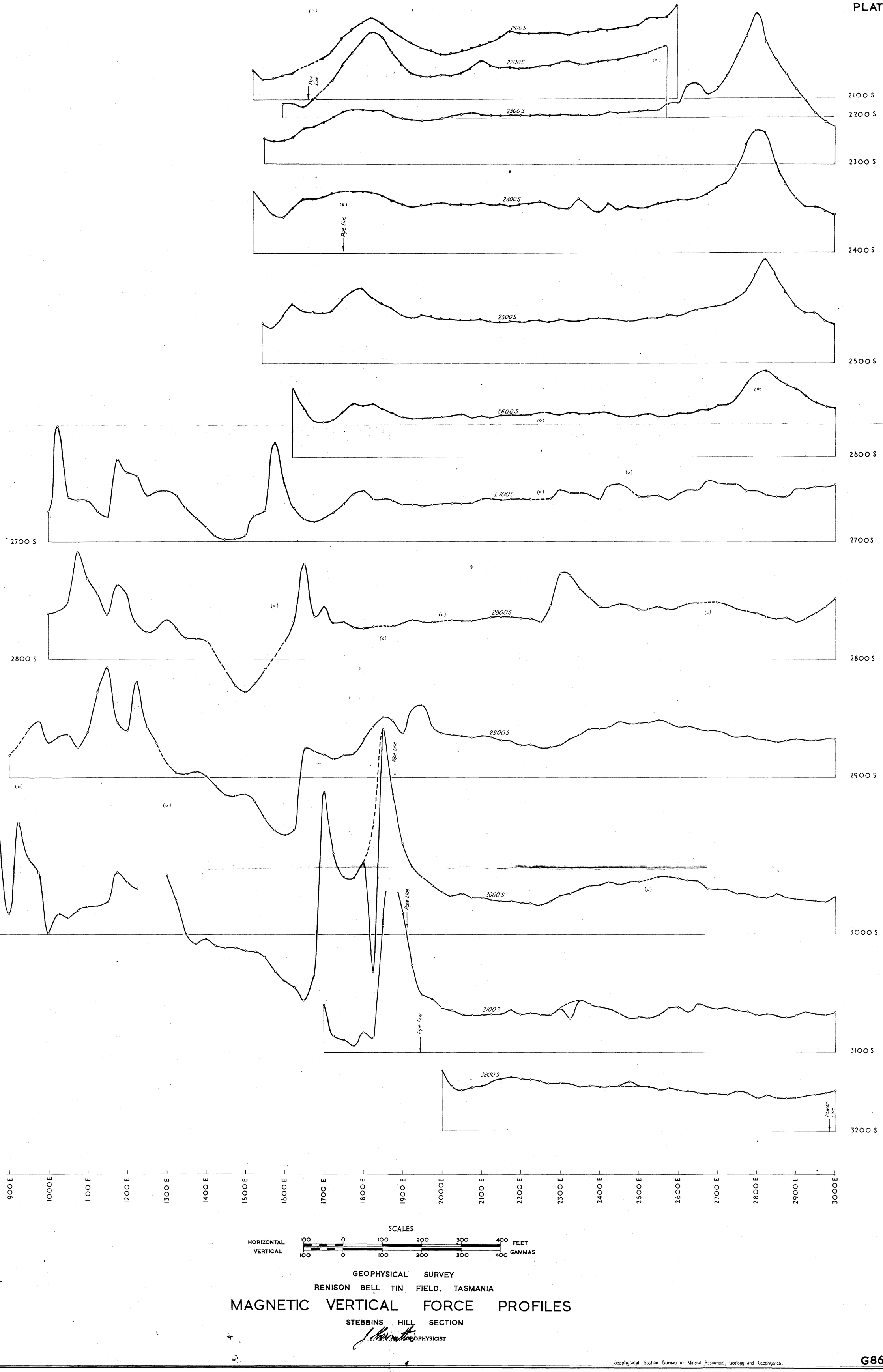
CONTOUR INTERVAL 50 MILLIVOLTS

J. Horsth

GEOPHYSICIST

Geophysical Section, Bureau of Mineral Resources Geology & Geophysics G 86—13

PLATE 4



SCALES

HORIZONTAL 100 0 100 200 300 400 FEET

VERTICAL 100 0 100 200 300 400 GAMMAS

GEOPHYSICAL SURVEY

RENISON BELL TIN FIELD, TASMANIA

MAGNETIC VERTICAL FORCE PROFILES

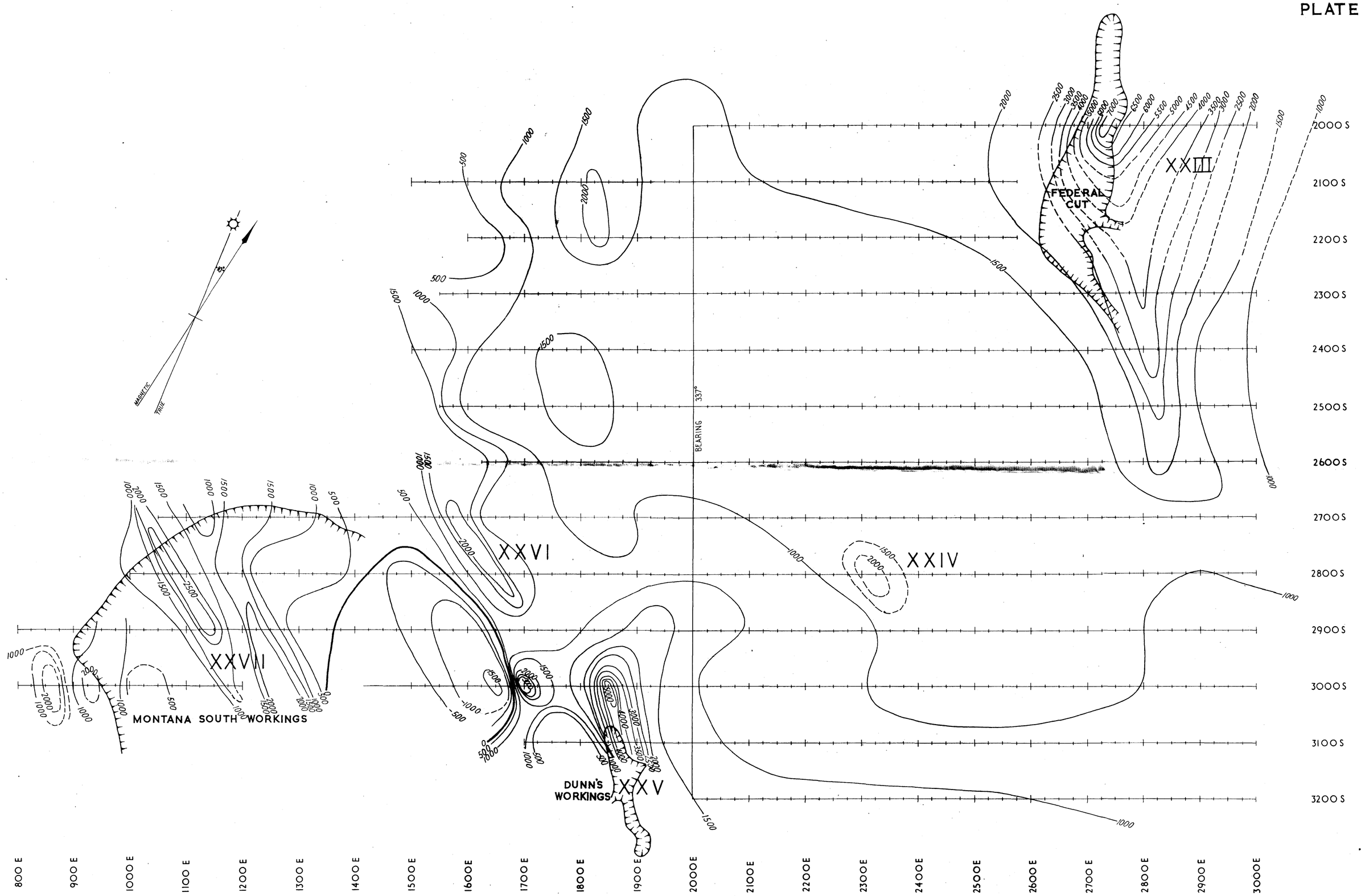
STEBBINS HILL SECTION

J. Thornett GEOPHYSICIST

Geophysical Section, Bureau of Mineral Resources, Geology and Geophysics.

G86–14

PLATE 5



SCALE

100 0 100 200 300 400 FEET

GEOPHYSICAL SURVEY

RENISON BELL TIN FIELD TASMANIA

MAGNETIC VERTICAL FORCE CONTOURS

STEBBINS HILL SECTION

CONTOUR INTERVAL 500 GAMMAS

J. Haworth

GEOPHYSICIST

Geophysical Section, Bureau of Mineral Resources Geology & Geophysics.

G86–12