

Q79 No 19.

368001

GEOLOGY OF AIRBORNE GEOPHYSICAL
ANOMALY 20/5
Moinwaring River

MICROFILMED

59-274

Anomalies 20/5N + 20/5S.
L.G.E. 4/5/59.
(+ ATTACHED FIGURES)

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Q83
Q78, Q79

LYELL - E.Z. - EXPLORATIONS

368002

4th May, 1959

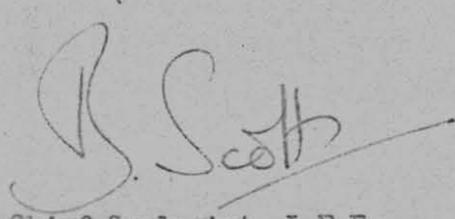
To: Mr. G.F. Hudspeth.

Anomalies 20/5N & 20/5S

The accompanying reports describe the geological and geophysical setting of airborne anomalies 20/5 N and S. There was no geochemical soil ?
sampling carried out over the grid as in an early stage of the investigation the anomalies were found to be spurious.

Conclusion

No further work is warranted on these two anomalies.



Chief Geologist, L.E.E.

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LYELL - E.Z. - EXPLORATIONS

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I. GEOLOGY OF AIRBORNE GEOPHYSICAL ANOMALY 20/5,

MAINWARING RIVER

1. Dates of Investigation: 28.11.58 to 3.1.59

2. Man Days in the Field: 72

<u>Personnel:</u>	Geologist:	I.M. Paltridge
	Student:	K. Fletcher
	Bushmen:	D.H. Watson
		R.J. Bennett

3. Summary

The airborne geophysical anomaly 20/5 is situated along the upper reaches of the Mainwaring River on the western side of the Osmund Syncline.

The older rocks exposed here are slightly pyritic, black, carbonaceous mudstones, with well developed cleavage and are probably part of the Dundas Group (Cambrian). The younger rocks, of Ordovician age, resemble, to some extent, the Owen Conglomerate, but should not be assigned to it as they differ in several important aspects from the type of this formation described by Bradley (1954). These Ordovician rocks, consisting of sandstones, conglomerates and mica-schists, should constitute a new formation in the Junee Group.

The Dundas Group seems, on photogeology, to be folded into broad open structures, but insufficient exposures were mapped to decipher structure on the ground. The Ordovician here forms part of the western limb of the Osmund Syncline and the associated anticline. This formation has been down faulted against the Dundas Group by the southern extension of the Lyell Shear. Crossing this major fault and the anticline are two smaller faults which form a very favourable geological setting for mineralisation.

4. Introduction

Anomaly 20/5 has, for convenience, been divided into two parts 20/5N and 20/5S, which have been mapped separately on different, unrelated grids. The relationship of the two parts is shown on Plate Q18 which also shows the regional geology. The anomaly is situated near the headwaters of the Mainwaring River about 3 miles north north-west of Mount Osmund (Plate P25R), and about 20 miles south of Birch. It is covered by air-photo 23/923/112.

Both anomalies were mapped on a scale of 200' to 1". Geochemical samples were taken every 100' along east-west traverses 400' apart. Topographical mapping was carried out with tape and aneroid along the traverses and geological mapping was tied to the grid thus established by compass bearings.

5. Topography

The landforms developed on the Ordovician sediments are of early maturity and have been cut into the Henty Surface which is here at a height of about 600' above sea level. The geologic structure exercises a marked control over the landforms and it was found that the ridges either consisted of, or were capped by, sandstone or conglomerate, while chlorite-mica-schists were exposed in the valleys.

The Cambrian rocks have been dissected to a late mature or old age stage, and are relatively low lying (about 300' above sea level) and swampy. Unlike the Ordovician rocks, the Cambrian sediments support a heavy growth of timber which hinders geological mapping.

6. GEOLOGY

Stratigraphy and Sedimentation

The two rock groups found in this area are faulted against each other by the Lyell Shear which is approximately parallel to, and on the western limit of, the grid prepared. The geology is shown on plates S1 and S2.

(a) Dundas Group (Cambrian)

These rocks outcrop to the west of the grid and but one exposure was made at 11E/50N. Here the Dundas consists of slightly pyritic, carbonaceous mudstones with a marked cleavage (LE1249). The rocks are massive and no bedding was seen.

(b) Junee Group (Ordovician)

The Junee rocks here consist of an assortment of rock types which suggest that they are of the same age as the Owen Conglomerate of Bradley (1954). However, although they are referred to this formation, they differ in several essential points from the type Owen Conglomerate. At 20/5, the lithologies found are:

- (i) Pebble conglomerate with quartzose cement and no hematite.

The pebbles were derived from Precambrian rocks and form a ridge on the southern end of 20/5S. They are well jointed and sheared.

- (ii) Quartz-muscovite-chlorite-schists, chlorite-muscovite-schists

and quartz-muscovite schists which form an interbedded series in the floors of valleys; ac-jointing is very prominent^{*} in these rocks.

(iii) Sandstones which in this area are massive, often friable and consist usually of well washed quartz.

This assemblage differs from the Owen Conglomerate of Bradley (1954) and should form part of a new rock unit. The sediments are apparently a near-shore deposit laid down in an environment of strong currents and fluctuating depth.

Structure

The major fold structure in the area east of the Lyell Shear is the Osmond Syncline, which plunges to the north. Near the Lyell Shear on the southern end of 20/5S there is some evidence of a complementary anticline as indicated in the accompanying cross section. However, this fold is cut off and probably distorted by the NW trending Urquhart fault (see Plate Q18).

Insufficient of the Dundas Group was seen in this area to draw any conclusions concerning fold structure from field observations. Despite this, from air photos it would seem that the Dundas Group has been broadly folded about north plunging fold axes.

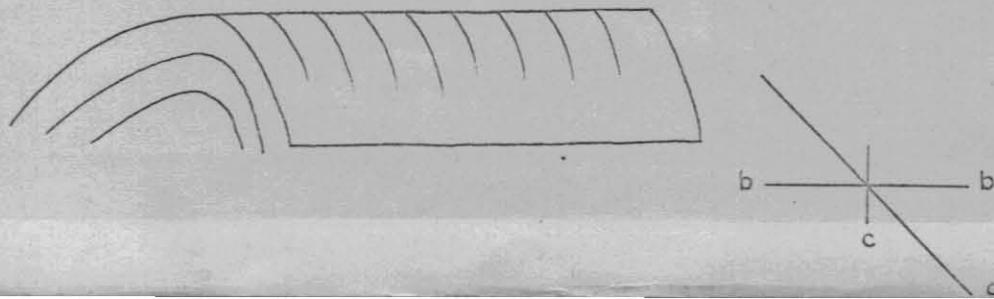
In and immediately west of 20/5S, there is a zone of cross faulting, the intersection of the Urquhart and associated faults and the Lyell Shear. While there are, to date, no ground geophysical indications of any mineralisation, the geological structure here is one favourable for mineralisation; namely, two intersecting faults cutting off an anticline.

This grid was later extended 900 feet west on lines 26 to 30 inclusive and has been mapped as anomaly 20/10, 20/5N has no structure of significance on it and lies to the east of the Lyell Shear.

Mineralisation

No significant mineralisation was seen during this mapping.

* ac-joints are those whose planes are normal to the fold axis or the b (median) stress axis of the triaxial ellipsoid of folding.



Conclusions

1. The area is, on structural grounds, one favourable to mineralisation.
2. Rock types similar to the Lyell Schists are found near the Lyell Shear.
3. Despite the lack of results from ground geophysical surveys, it seems advisable to extend the mapping grid west to cross the Lyell Shear and carry out further geological, geophysical and geochemical surveys.

J. Michael Partridge

Reference: Bradley, J. 1954 The Geology of the West Coast Range of Tasmania. Pap. Proc. Roy. Soc. Tas. 88., pp. 193-243.

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II. Geochemical Investigation - Anomaly 20/5

Sampling

Soil samples 1,000 to 1,145, lots 11 and 12 were collected from these grids and analysed for copper, lead and zinc.

Comments

No significant concentrations of base metals were found in these samples.

J. Michael Raltridge

3rd April,

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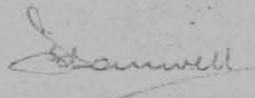
A.E.M. Anomaly 20/5

Ground geophysical coverage of both North and South sections of this anomalous zone was undertaken by McPhar and reported on by D.B. Sutherland.

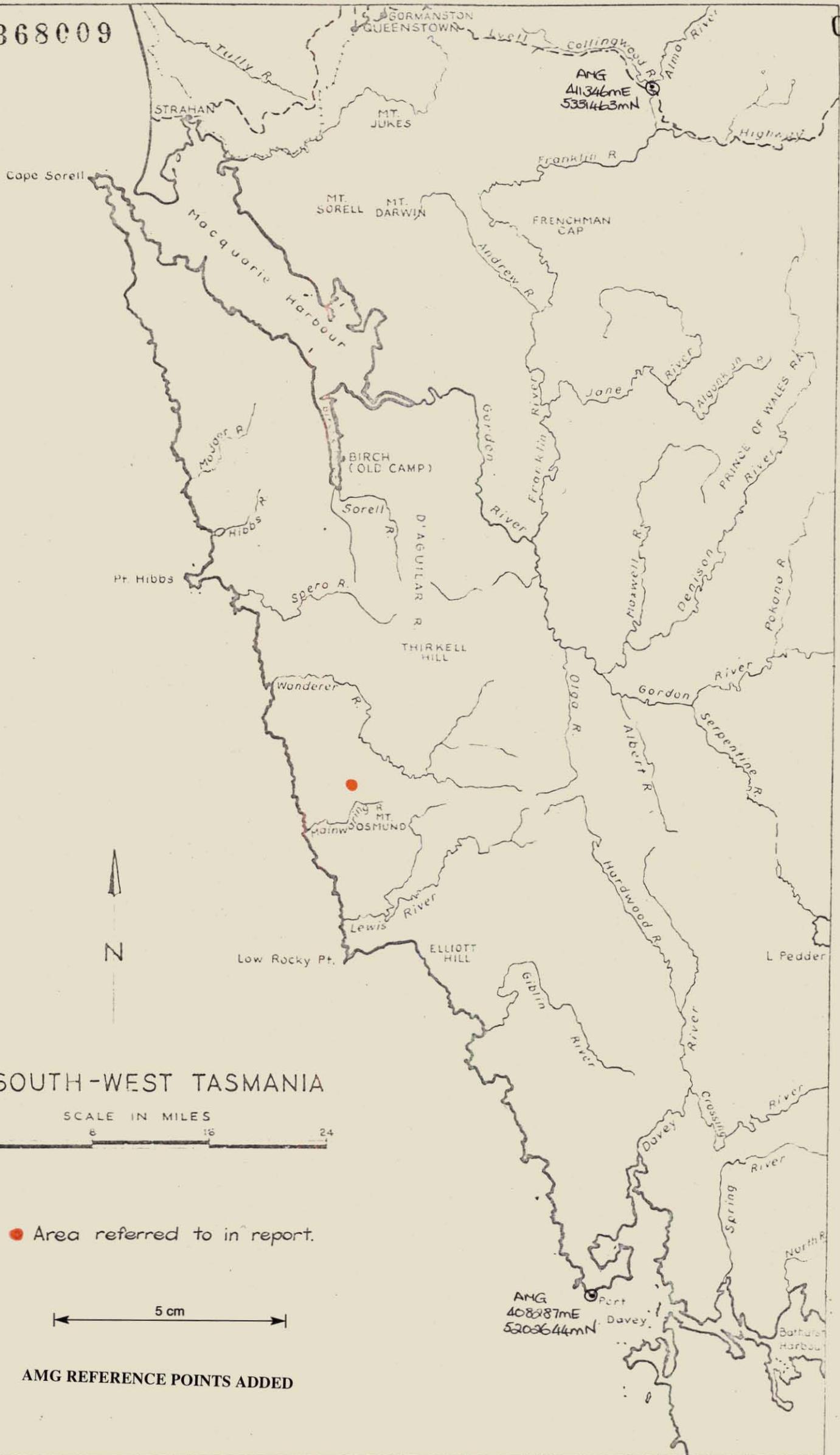
The results therefrom clearly indicated that no anomaly outlined on the ground could be identified with the airborne responses - that in the North half of the 20/5S grid was too far displaced and possibly of too poor quality too deep, those elsewhere, including 20/5N, far too small and far too nebulous.

Examination of the air-traces from lines 555 to 548 inclusive, all flown from West to East, shows first, that the possibility of mis-plotting is not a factor, and second, that the air-expressions are all similarly positioned in exact relationship with the change in topographic relief due to the Owen Conglomerates. To the South, this change broadens and becomes more subdued, and the anomaly fades correspondingly. To the North, significantly, the relationship ceases immediately the flight direction is reversed - lines North of 555 are flown from East to West.

Thus, the air-anomaly is concluded unreal. The faulted western contact of the Owen was traversed on the ground by at least one line, and the existing evidence suggests that it is not distinguished by any marked geophysical expression.



J.B. BONIWELL.

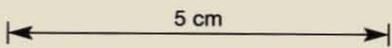


SOUTH-WEST TASMANIA

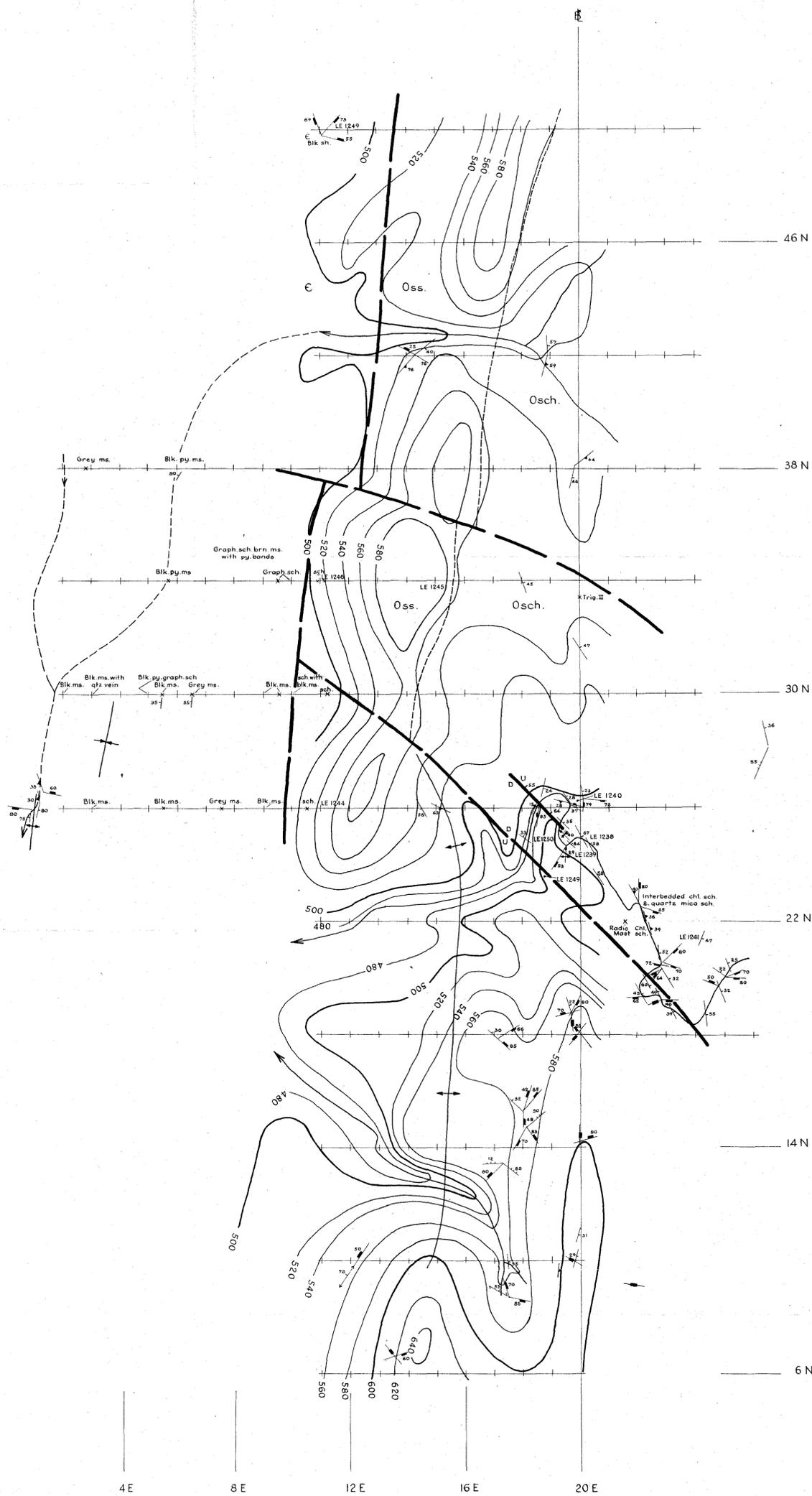
SCALE IN MILES



● Area referred to in report.



AMG REFERENCE POINTS ADDED

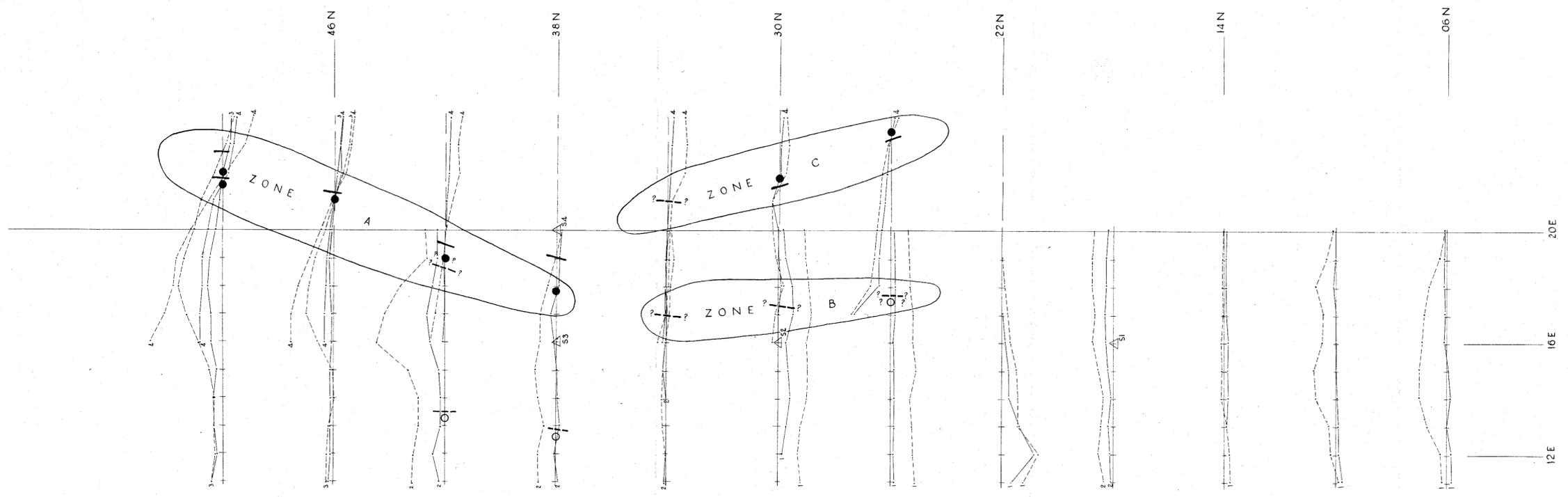


Field Book No 12
 Photo No 23/922/112
 Topographic contours
 C.I. 20 ft.

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ANOMALY 20/5 S

GEOLOGY		Scale	
Survey	L.M.P.	Dec. 58	5000
Geology	L.M.P., P.R.	Dec. 58	2000 ft.
Geophysics			to
Conductivity			1 inch
D. No.	J.R.G.	Jan. 59	Sheet
	D.S.	May 59	No.
			2290



Mag. North



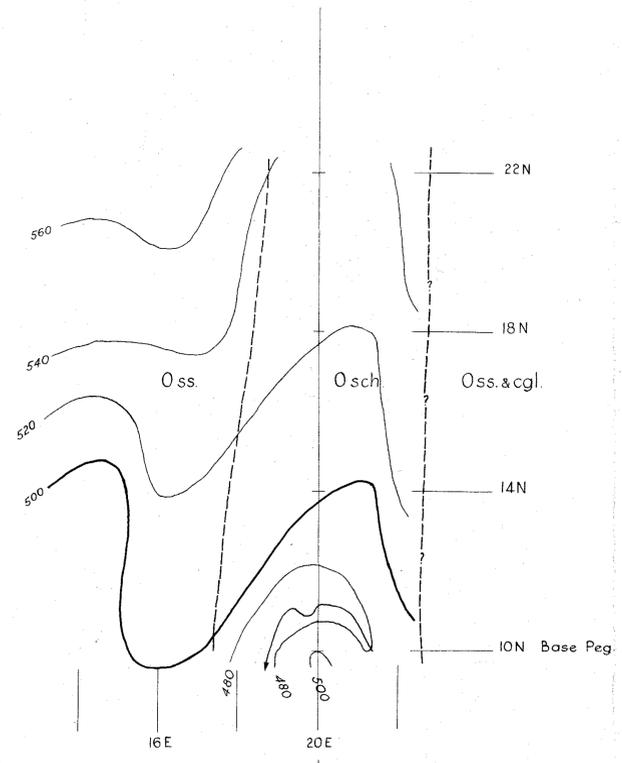
Conductor axis established ●
 Location of conductor axis uncertain ○?
 Possible conductor axis ○?○?

Low —
 High —

1000 cps —
 5000 cps - - - -

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References		Scale		Sheet No. 10	
1000 cps —		Hor. 200ft. to 1 inch		SI	
5000 cps - - - -		Vert. 20° to 1 inch.		2291	
Survey		Geology		Drawn	J.R.G. Feb '59
Geophysics	D.B. Sutherland Jan '59	Geochronology		Toiled	J.R.G. Feb '59
LYELL E.Z. EXPLORATIONS QUEENSTOWN ANOMALY 20/5 S					

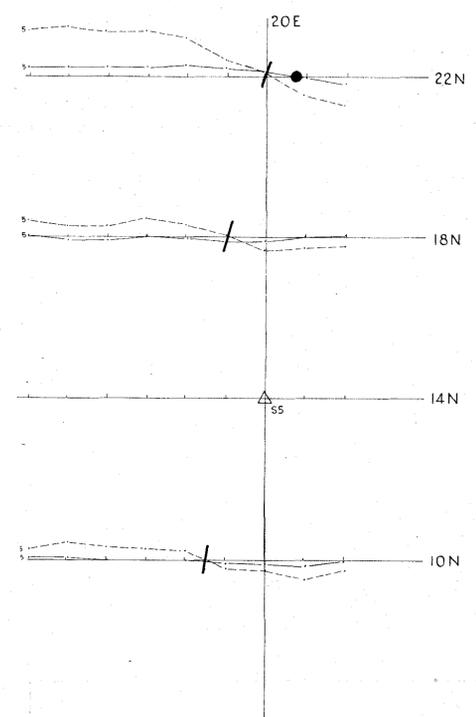


Mag. North



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References Field Book N° 12 Photo N° 23/1923/112		LYELL E.Z. EXPLORATIONS QUEENSTOWN			
ANOMALY 20/5 N					
Survey	I.M. Paltridge	Dec. '58	5 in		
Geology	I.M. Paltridge	Dec. '58	200 ft.	S2	Sheet No. 1
Geophysics					
Geochemistry			to		
Drawn	J.R.G.	Jan. 59	1 inch		
Titled				2292	



Mag. North



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References 1000 cps ——— 5000 cps - - - -	LYELL E.Z. EXPLORATIONS QUEENSTOWN			
	ANOMALY 20/5 N			
Survey			Scale	Sheet S 2 No. 10
Geology			Hor. 200 ft. to 1 inch	
Geophysics	D.B. Sutherland	Jan. '59	Vert. 20° to 1 inch	2293
Geohemistry				
Drawn	D.B. Sutherland	Feb. '59		
Typed	J.R.G.	Feb. '59		
VERTICAL COIL				