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LYELL E.Z. EXPLORATIONS
Queenstown

Report on

ANOMALY 10/8

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365002

6th May,

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To: Mr. G.F. Hudspeth

Anomaly 10/8

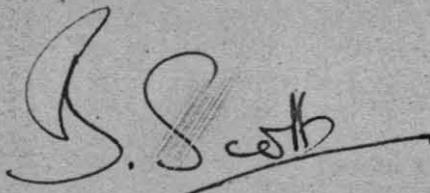
The accompanying reports describe the geological and geophysical setting of airborne anomaly 10/8.

The ground follow-up has located a zone of hematite/magnetite mineralisation which varies in width from 15 feet on line 4S to 250 feet (as defined by magnetic activity) on line 4N, with a known strike length of approximately 1300 feet. This increase in width of mineralisation northwards also appears to be spatially related to the introduction of magnetite, the mineralisation on 4S and 00 being hematite and on 4N hematite/magnetite. Apart from very minor copper staining, no sulphides have been detected at the surface but it is recommended that the zone is tested at depth by diamond drilling. Since the mineralised zone has not yet been completely outlined, the work should follow two stages:

Stage 1 Outline of existing mineralised zone. This can be accomplished by extending the existing baseline to 24N as an access track to the north, and "walking out" the surface exposure of the mineralisation.

Stage 2 The drilling of a selected section on the work of Stage 1. It is anticipated that only one hole need be drilled to test the zone, some 800 feet in length.

Stage 1 should be completed and the final recommendation for drilling available by 1st December, 1959.



Chief Geologist, I.E.E.

I. GEOLOGY OF AIRBORNE GEOPHYSICAL ANOMALY 10/8, BIG CREEK

1. Dates of Investigation: 28.3.59 to 9.4.59

2. Man Days in the Field: 53

<u>Personnel:</u>	Geologist:	I.M. Paltridge
	Geophysicist:	I.M. Sefton
	Bushmen:	T.W. Burrell
		D. Scott
		R.J. Bennett

3. Location: This anomaly is situated on the southern side of Big Creek about 1 mile from the coast (Plate 25R) and about 10 miles north west of Birch. The geological setting is in Cambrian rocks near the intersection of two faults between the Cambrian and Precambrian. The anomaly is covered by air photo 12/890/71.

4. Topography

The Cambrian rocks which have been deeply dissected below an erosion surface at about 150 feet above sea level support a moderate timber growth in sharp contrast to the Precambrian rocks. The latter are, in the main, not deeply dissected and are covered by button grass.

5. GEOLOGY

This is shown on plate Q/1.

Lithology

The Cambrian, the country rock for mineralisation found in this area, is chlorite schist with quartz veins. The bedding, to which cleavage is sub-parallel, strikes north-east and dips steeply to the northwest. The fine quartz veins are roughly parallel to cleavage and bedding.

Structure

Insufficient time was available to determine the structure in this area, but geophysical results have indicated certain structures. Nothing was seen in the area which would confirm or deny this interpretation.

Mineralisation

On this anomaly, mineralisation, which consists largely of hematite, was noted on all lines. The best exposure, on the west end of line 00, is about 50' thick and over 100' deep in a stream valley. The zone, which is approximately vertical, narrows to the south, but apparently broadens to the north. In hand specimen, the material consists of massive hematite with a little limonite and some copper staining.

On assaying a sample from this zone, traces of copper, gold, silver, manganese and titanium were found with 68.90% Fe, 0.03% S and 1.48% SiO₂.

This suggests that the exposure is almost entirely hematite with no sulphides, but, even though hematite is probably not present in economic quantity, the zone is worthy of further inspection.

Conclusions

Insufficient geological evidence is available to suggest more than that this anomaly is worth further detailed geological investigation. A short adit in the mineralisation might be the cheapest method of investigating this but to be followed by drilling from sites selected on the basis of geological and geochemical investigation.

J. Michael Partridge

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GEOCHEMICAL INVESTIGATION 10/8

Sampling

Soil samples 1444 to 1506, lot 21, were collected from this grid and analysed for Cu, Pb, Zn and ?Fe.

Comments

1. Negligible copper was recorded from these samples.
2. Some small zinc concentrations were recorded from line 00 where peaks of 500 ppm were obtained. One peak in the eastern end of this line is inexplicable. The peaks on the western end of the line are on either side of the mineralised outcrops. Notice that no zinc is concentrated on the north line where the mineralised zone widens but a small peak is found on the southern line. The peaks in all cases are displaced either side of the actual zone of hematite mineralisation.
3. Insignificant Pb concentrations (20 ppm) were recorded from line 4N and the western end of line 00, but it should be noted that these concentrations are displaced on 4N in a similar manner to the zinc.

Conclusions

1. The concentrations are not suggestive of ore grade mineralisation, although they indicate that Pb and Zn minerals are present and may be expected at depth.
2. It seems unlikely that Cu mineralisation of economic significance will be found.
3. Further geochemical work of a reconnaissance nature should be considered before any drilling is decided upon.

22nd April, 9

A.E.M. Anomaly 10/8

The airborne response is distinguished by a unique magnetic closure of 300 gammas in close association with it, and which is centred, apparently, on a faulted contact between rocks of Cambrian and Precambrian age. The indicated electrical strike is transgressive to that of the contact and regional bedding. The electromagnetic anomaly itself is best recorded on line 641 - 0.6 degree phase shift at 570' in a ratio of 1.00 - where, nonetheless, it still exhibits a fairly faithful dependence on the altimeter trace.

Ground electromagnetic coverage, unfortunately, is not complete, nor homogeneous. Line 4N was run with the large vertical loop unit by the standard field technique; CL by the low-powered reconnaissance unit (REM) with the transmitter traversing in tandem along line 4S. Several conductor indications were obtained on both lines, but they are not easy to relate on electrical characteristics alone. A wide zone of conduction, circa 250', is implied on line 4N between stations 4W and 6W.

It is not clear what the aircraft has detected. Uncertainties are introduced by a 350' displacement between em. and peak magnetics in the airborne data, the significance of which is seen below, the high recording altitude coupled to altimeter effects, and the apparent lack of transgressive strikes on the ground.

Intense magnetic activity was observed on line 4N, highly irregular in its local expression, but generally at a high plateau level over the zone of wide conduction. Immediately beyond, edge effects are manifest in

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flanking zones of negative magnetic centres. The general order of the observed intensities suggests two things:

- (a) the incidence of magnetite, possibly massive in narrow seams, but as a body, 250' wide, not averaging beyond 10%.
- (b) a "dip" grid West to an irregular body of not large depth extent.

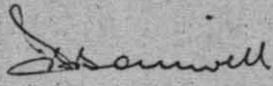
A gravimetric coverage of the grid area has apparently provided an expression of excess mass in correlation with this conducting magnetic body. But the actual magnitude of the expression is difficult to gauge in an area of complex regional trends not fully resolved. A 50' width of hematite was mapped in Cambrian Dundas at 9W/CL, narrowing to the South, but rapidly broadening to the North. This mineralisation, although conducting, is significantly non-magnetic. Yet, the gravity profile on the CL shows a trend on strike quite analogous to the corresponding portion of the anomaly resolved on the wide magnetic zone on line 4N. This is taken to mean that some structural effects are present; and a possible representation is shown in plan, following the recognition by geology that the major fault contact with the Precambrian must occur in the East half of the grid area.

But considering the most optimistic solution: that the residual gravity anomaly above the traverse datum on line 4N is wholly due to a mineralised mass (in which case, it must dip grid East), then a figure of just over $\frac{1}{2}$ million tons of massive magnetite-cum-hematite (and/or pyrite) is arrived at independent of depth. As this represents 400' of strike length, the maximum strike length allowable by aerial and ground evidence, 1600', only provides a factor of 4, or a tonnage figure somewhere about the 2 million mark. For iron-ore, this is insignificant. Tonnages, of course, would be considerably greater for more disseminated ores, but the actual iron-ore content naturally would remain independently stable.

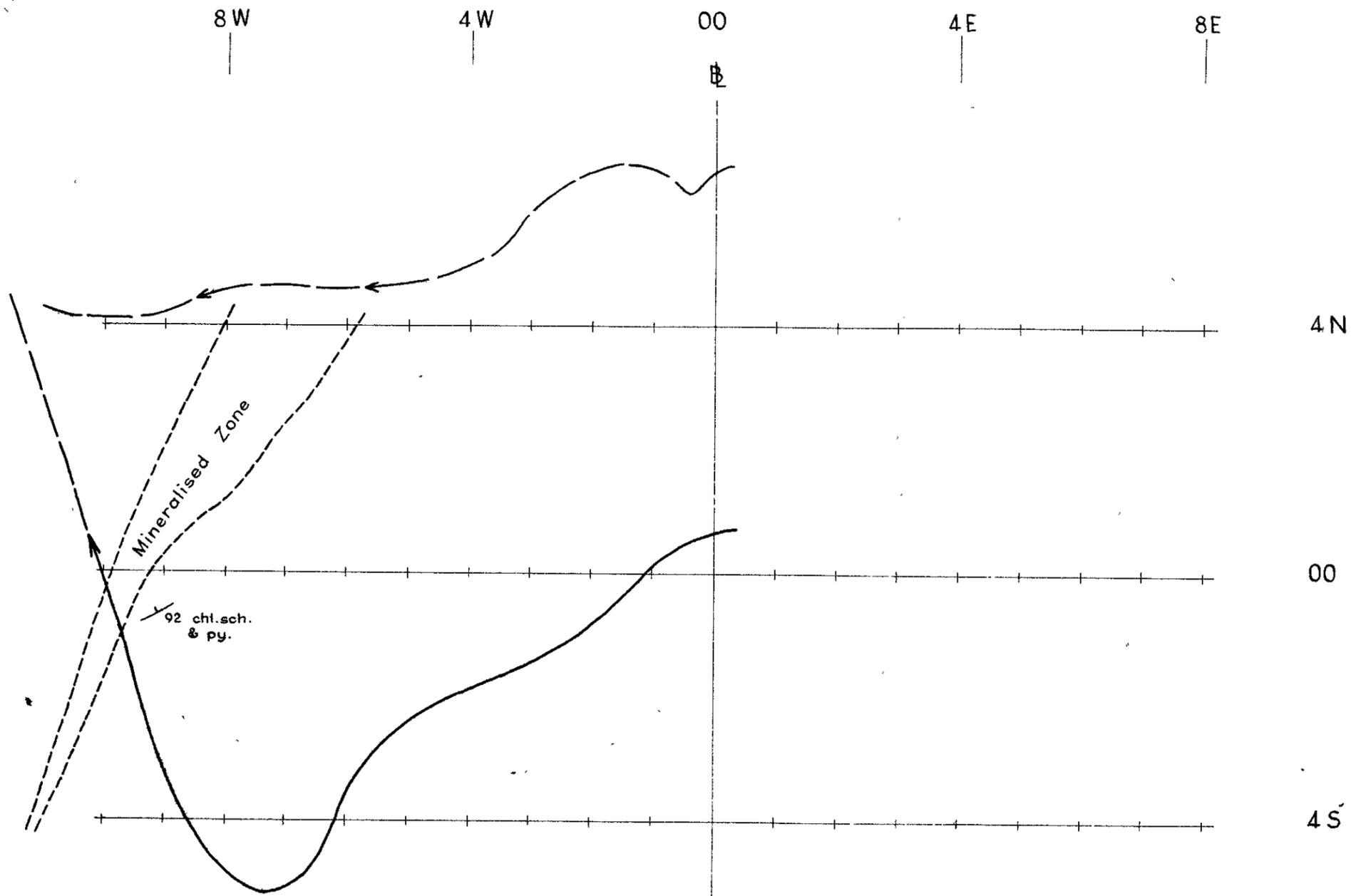
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Thus, the potential of this mineralised setting resolves upon the presence or no of other metalliferous ores, that is, more than probably, upon the co-presence of sulphides. Outwardly, there appears little hope that geophysics can resolve such an association although some determinative work is possible once the fact is established.

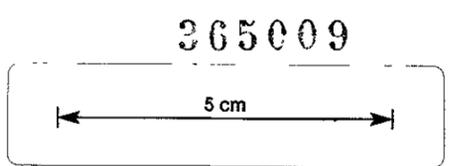
As the anomaly sources are shallow seated, the probabilities of such contemporary mineralisation should be indicated by surface prospecting, geology and geochemistry. Further work, including drilling, should be planned only if their findings deem it necessary.



J.B. BONIWELL

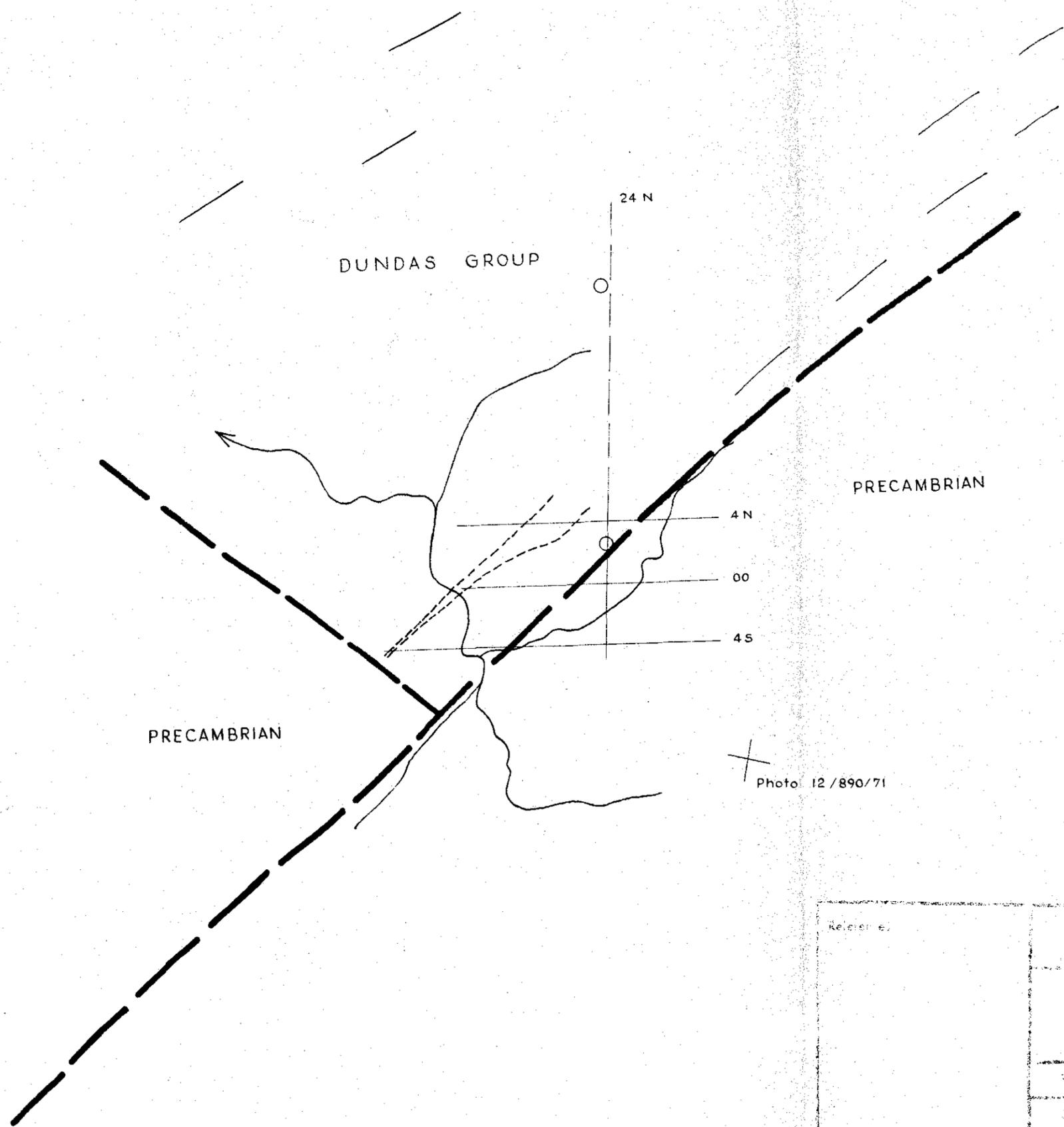


True North (approx.)



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References	LYELL E.Z. EXPLORATIONS QUEENSTOWN				
	ANOMALY 10/8				
	Survey			Scale	2312
	Geology	I.M.P.	Apr. 59	200 ft. to 1 inch	Q 29 Sheet No. 1
Geophysics					
GEOLOGY	Drawn	I.M.P.	Apr. '59	Checked by: <i>[Signature]</i>	
	Traced	D.S.	May '59	Date: 14.7.59	



LEGEND

- Photo fault
- Photo bedding
- Existing grid
- Extensions to grid
- Airborne e.m. response
- Mineralisation

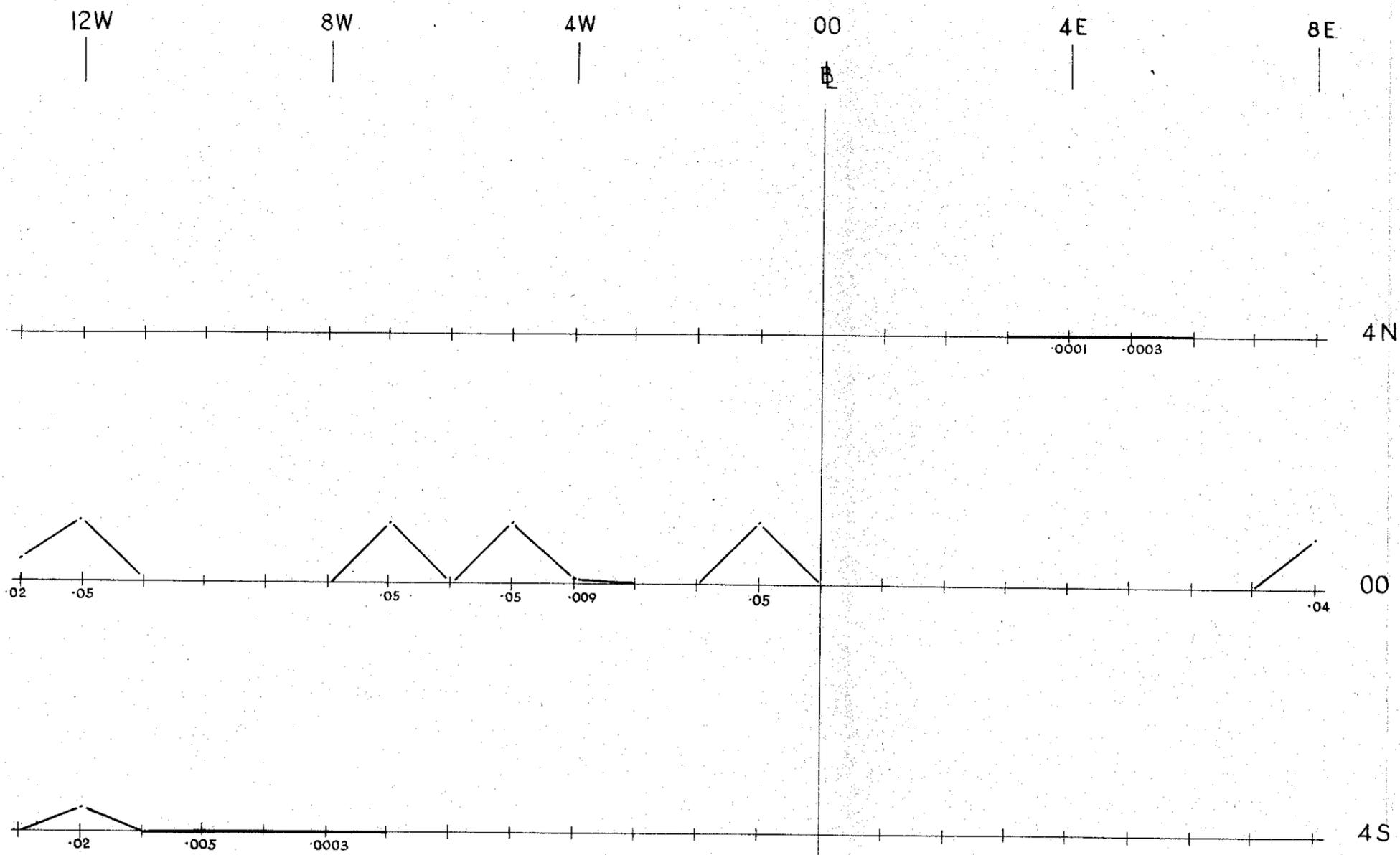


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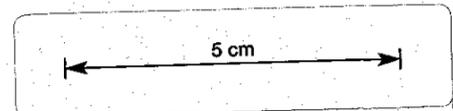
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<p>REGIONAL GEOLOGY</p>		<p>LYELL EXPLORATIONS OF B. TOWN</p>	
<p>ANOMALY 10/8</p>		<p>2313</p>	
<p>Scale</p>	<p>750 ft to 1 inch approx.</p>	<p>Q 29</p>	<p>1a</p>
<p>B.S.</p>	<p>Apr '59</p>	<p>14. 7. 59</p>	
<p>D.S.</p>	<p>May '59</p>		



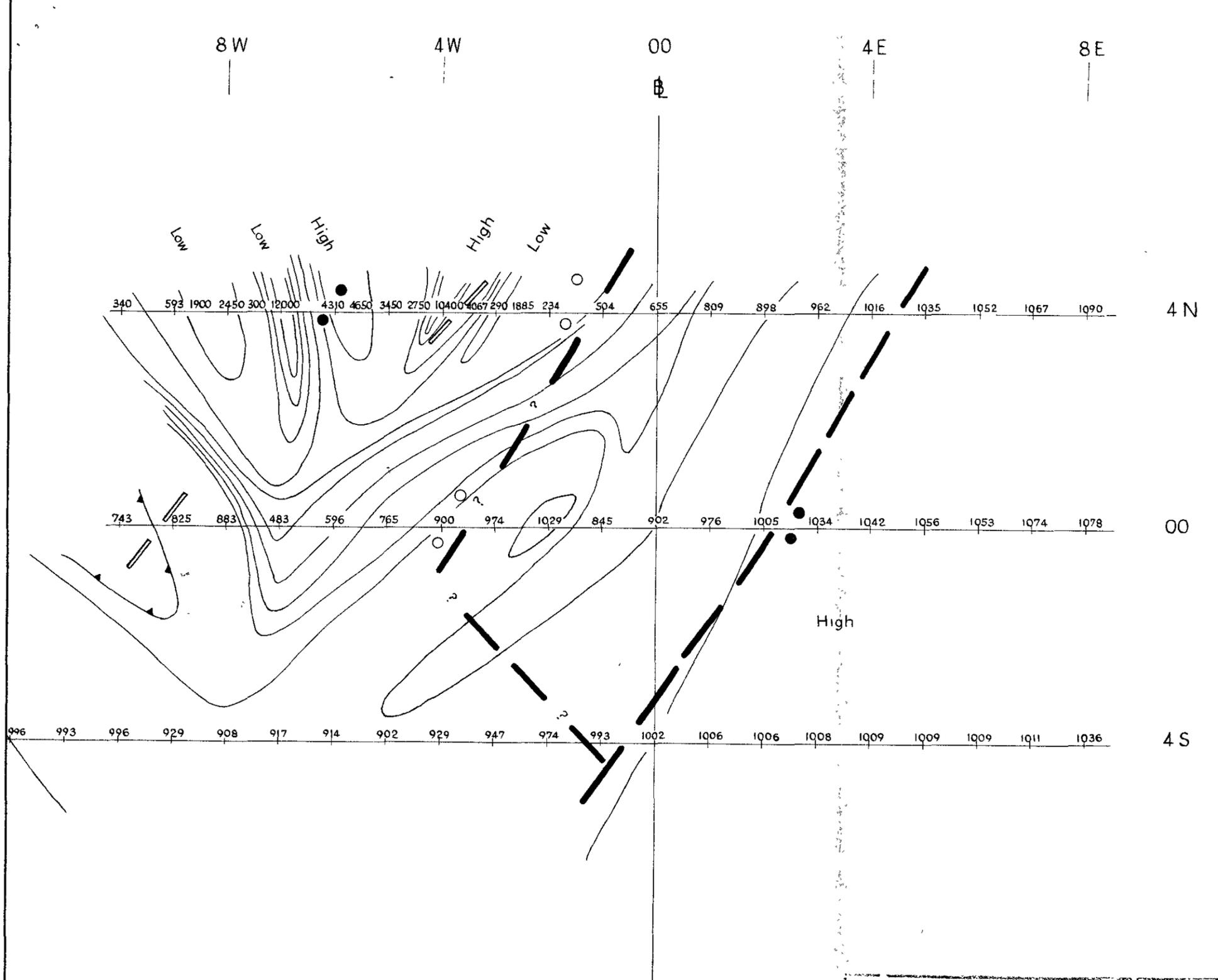
365011



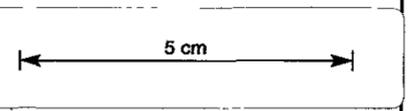
True North (approx.)

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References Zn	LYELL E.Z. EXPLORATIONS QUEENSTOWN			
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	Geophysics			
	Geochemistry	I.M.P.	to	No 2
	Drawn	I.M.P.	1 inch	Checked by <i>[Signature]</i> Date 14.7.59
	Traced	D.S.		
GEOCHEMISTRY				



True North (approx)



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References

Magnetic contours
 C 1 100γ down to 400γ
 2000γ above 400γ

— EM Axes
 — Fault Axes

MAGNETIC

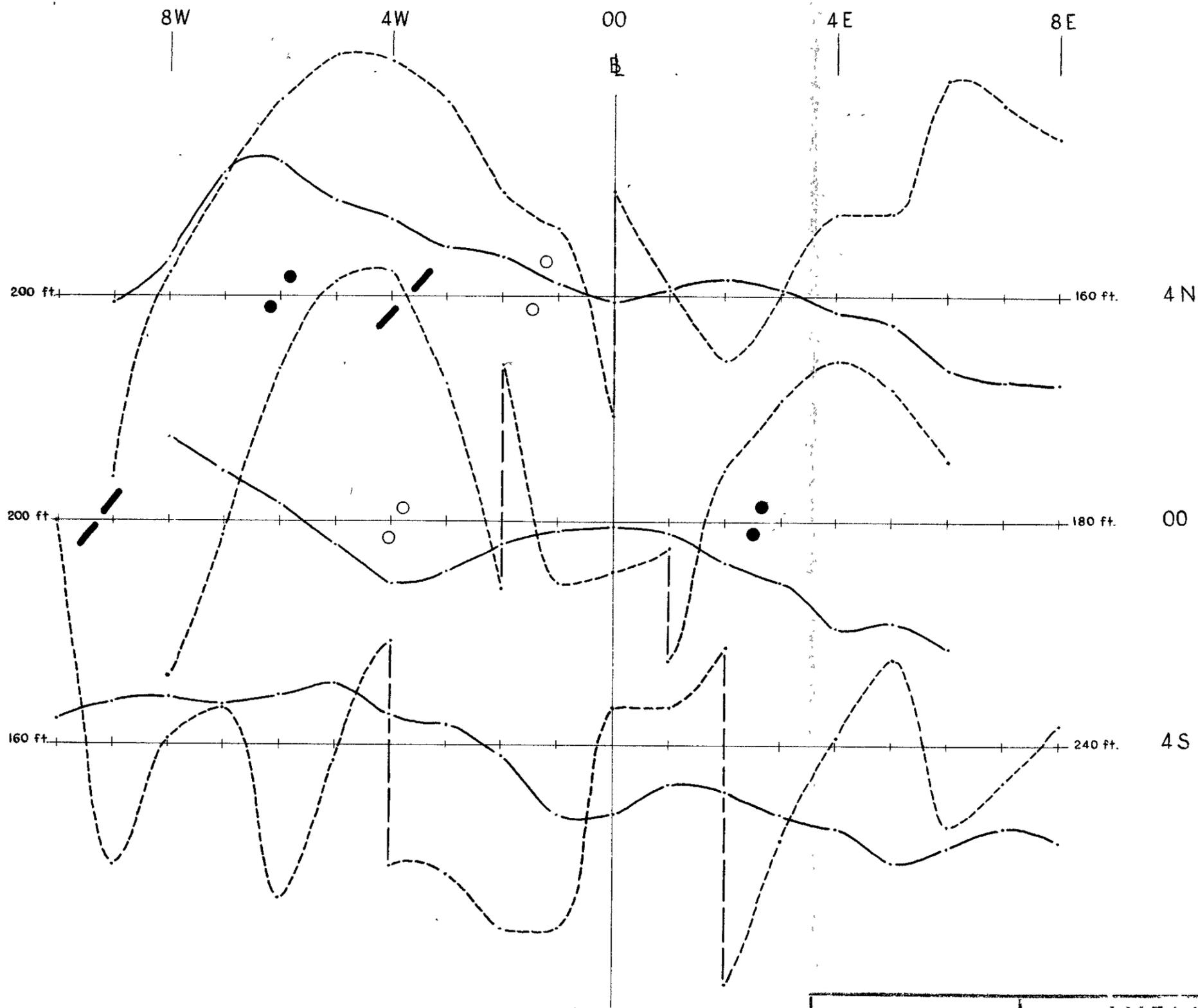
LYELL E.Z. EXPLORATIONS
 QUEENSTOWN

ANOMALY 10/8 365012

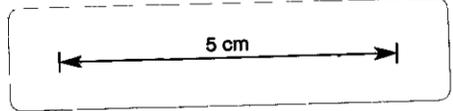
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Geology			
Geophysics	IMP	Apr '59	200 ft
Geology			to
Survey	J.B.B.	Apr '59	1 inch
	D.S.	May '59	

Q 29 Sheet **3**

14.7.59

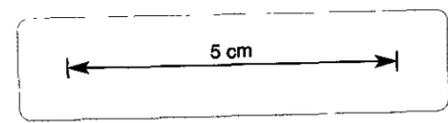
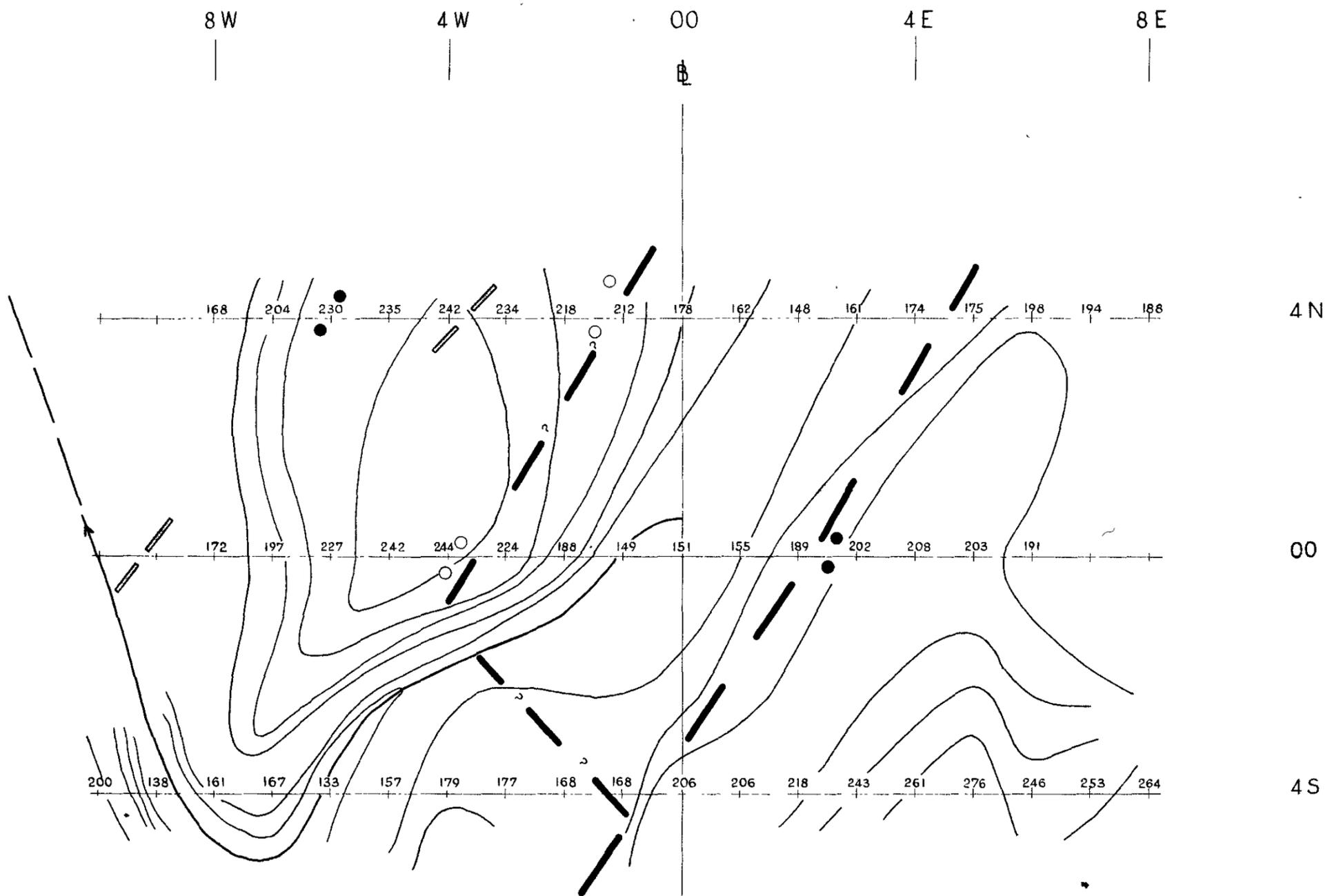


True North (approx)



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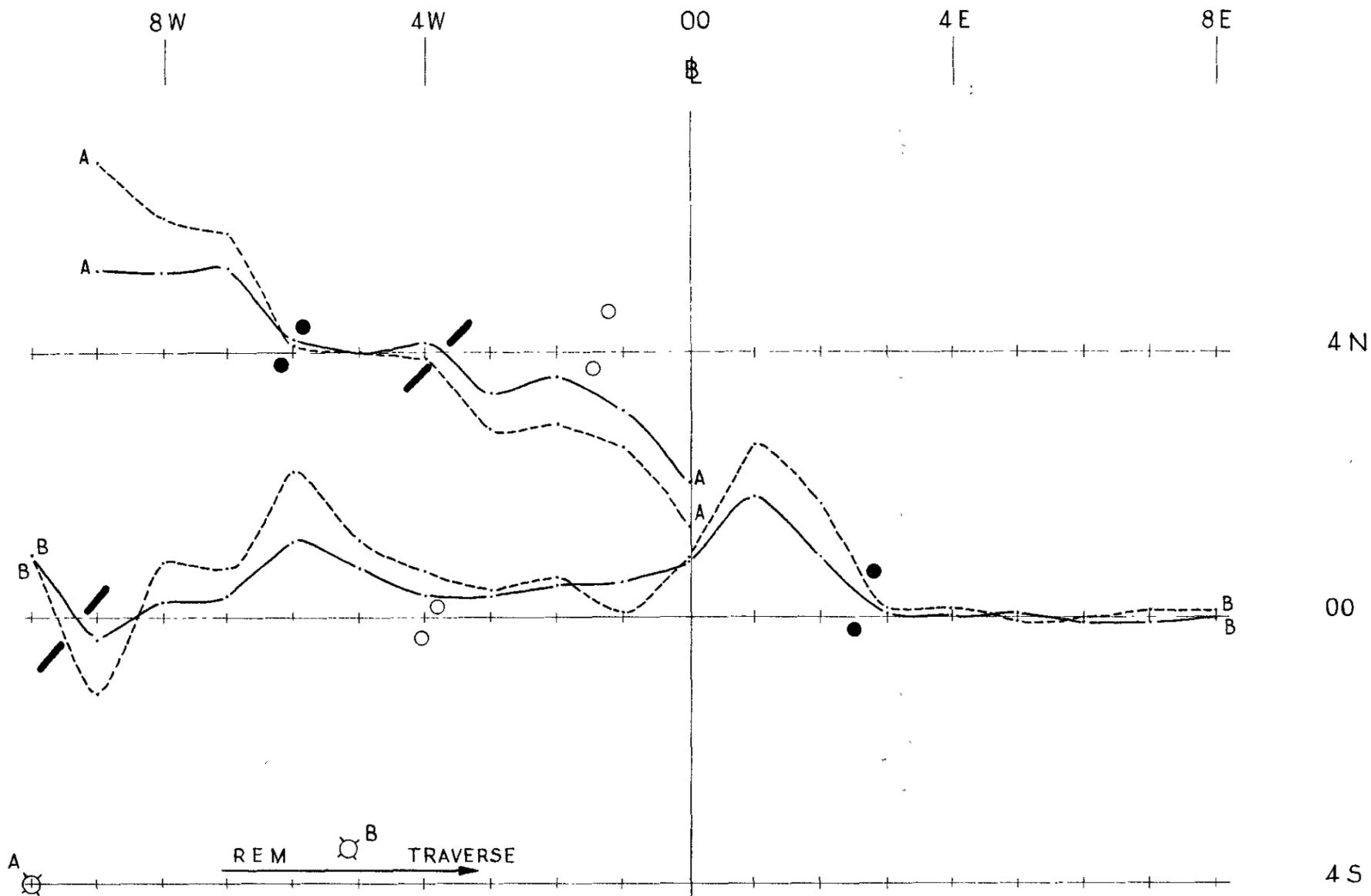
References		LYELL E.Z. EXPLORATIONS			
— Bouguer Gravity		QUEENSTOWN			
- - - Topography		ANOMALY 10/8			
E.M. Axes		Survey		Scale	
				2316	
		Geology		Hor	
		Geophysics		200'to 1"	
		I.M.S.		Apr '59	
		Geophysics		Vert	
		J.B.B.		20'to 1"	
		Apr '59		Δg	
BOUGUER GRAVITY		D.S.		1"=10mgal	
		May '59		Q 29	
				Sheet No 4	
				14.7.59	



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References		LYELL E.Z. EXPLORATIONS		QUEENSTOWN	
Topographic contours C.I. 20 ft		ANOMALY 10/8 STRUCTURAL INTERPRETATION FROM GRAVITY			
— E.M. Axes — Fault Axes					
Survey		Scale	2317		
Geology		200 ft to 1 inch	Q 29	Sheet	4a
Geophysicist	J B B			Apr '59	
Geophysicist	J B B		Apr '59		
Checked	J B B	Apr '59			
Drawn	DS	May '59			
GRAVITY					

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References				LYELL E.Z. EXPLORATIONS			
— 1000 cps				QUEENSTOWN			
- - - 5000 cps				ANOMALY 10/8			
Survey			Scale	2318			
Geology			Hor	200 ft to 1 inch	Q 29	Sheet No 10	
Resistivity	TNB	Apr '59	Vert				
Stratigraphy			20° to 1 inch				
Location	J.B.B	Apr '59					
Equipment	DS	May '59					
VERTICAL COIL							