

1955/82

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RECORDS 1955, No. 82

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COMPARISON OF GEOPHYSICAL AND
GEOCHEMICAL RESULTS AT
LABOUR VICTORY MINE,
NEAR SELWYN, QUEENSLAND



by

J. HORVATH

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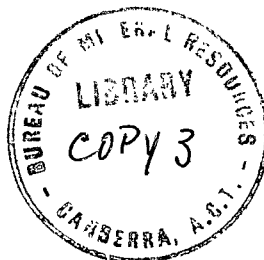
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Introduction

The geochemical map (copy attached) prepared by Mt. Isa Mines Ltd., has been compared with plans showing the self-potential and electromagnetic results of the geophysical survey carried out at the Labour Victory Mine, near Selwyn, Queensland in 1952 and 1953. (Plates 4 and 7 of B.M.R. Records 1954, No. 2). Transparencies of these two plates are also attached.

The Geochemical Map

The geochemical map includes samples from old mine dumps. It would probably have been better to omit these samples as they are not of undisturbed surface soil, but are due to mining activity. These samples from the dumps (marked D1-D4) give a pronounced effect to the map. The higher copper values are not confined to the dumps but also extend for some distance into the surrounding areas. This indicates a considerable amount of migration of copper values within a short period. This is not surprising however, as oxidised copper minerals are much more soluble than, for instance, lead minerals.

As the migration of metal values mainly follows the direction of the surface and near surface water, which in the Labour Victory area has mostly a north to south movement, the tail of high copper readings will be mainly to the south of the original occurrence. If these considerations are taken into account the agreement between geophysical and geochemical results is fair, but not as good as in some other areas where geophysical and geochemical results have been compared.

Points of agreement.

The best agreement between geophysical and geochemical results in the Labour Victory area is found between traverses 400N and 300S. Here the influence of the known Labour Victory ore body can be seen clearly on all maps, though not as strongly on the SP map as on the other two.

A second important point of agreement is that the main SP and geochemical anomalies both terminate towards the north at about 900N.

The western boundary of the geochemical anomaly almost coincides with the axis of the SP anomaly, but the geochemical anomaly itself extends for several hundred feet eastwards across the direction of the strike and includes several high copper values within a broad belt.

Interpretation.

It can be inferred from these results that the main SP anomaly is in fact due to mineralisation, but it is probably not due to an ore body with sub-outcrop at shallow depth beneath the surface soil. If such an ore body were present, the copper values on traverses 300N to 900N between 300E and 400E would have been higher and would have shown a pronounced maximum with values trailing off towards the east and falling more rapidly to the west. The copper values observed west of 300E are only normal background values.

The broad zone of high copper values cannot be explained by a creep of copper values down slope, as a low ridge begins about 200N/400E and rises gradually towards the north. The broad pattern of high copper values, with some irregularly distributed maxima, can probably be best explained by assuming the existence of a wide mineralised shear zone similar to Mt. Elliott.

The northern part of the area (between 400N and 1200N) was not surveyed by EM methods, but only by the SP method.

Points of disagreement.

The southern end of the SP anomaly can be placed at about 100N although a rather weak extension can be followed to about 300S. The southern end of the EM anomaly is located at about 400S. However, neither SP nor EM results indicate an ore body between 400S and 900S, whereas the geochemical map does.

Hence there is a discrepancy between geophysical and geochemical results in this southern part of the area. There is a slight EM indication farther south at 1100-1200S which has no counterpart in the SP results; this has already been mentioned in the geophysical report.

Possible explanations

At present no explanation can be offered for the absence of geophysical indications corresponding to the geochemical indications south of 350S. It must be mentioned that some shallow pits and workings show some evidence of mineralisation, but these mining attempts do not seem to have been successful.

If the assumption of a mineralised shear zone, as the source of the geochemical anomaly, is accepted, there remains the difficulty of explaining the absence of geophysical indications. An investigation, by drilling, of both parts of the geochemical anomaly - the one with and the other without the geophysical indication - would be of great interest not only for the investigation of the Labour Victory deposit, but also for the understanding of the cause of the geophysical and geochemical indications.

Perhaps the geochemical "highs" in the southern part are due to an eroded deposit with only some remnants left, while the geophysical indications farther north are due to richer mineralisation at greater depth. A well defined copper lode reaching to the surface between 300N and 900N can hardly be expected from the available evidence, but only a drill hole can prove or disprove the existence of economic copper mineralisation at greater depths.


Other indications

North of traverse 900N the absence of higher copper values, in the geochemical results between 300E and 550E, might be due to a cross fault which displaces the northern

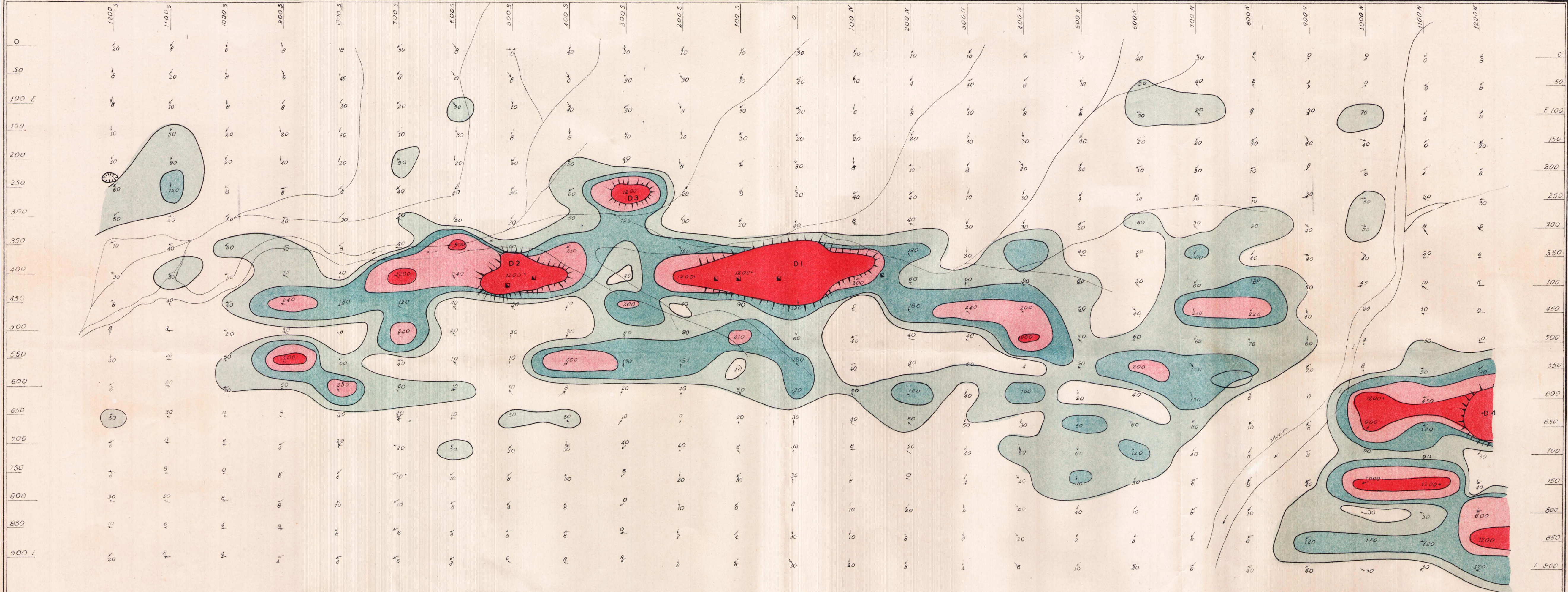
block about 300 feet to the east. On the two northernmost traverses (1100 and 1200N) the geochemical results indicate high copper values between 550E and 900E. There are some small copper workings in this area. The SP results do not give such a distinct anomaly, but a weak one was observed on 1200N. If, however, the conditions as found in the southern part are repeated, the SP anomaly should increase towards the north beyond 1200N.

Testing

Regarding drilling targets, as already given in the geophysical report, no important changes are recommended. A drill hole might be added on traverse 600S to test the geochemical anomaly and to find the reason for the absence of any geophysical indications.


(J. HORVATH.)
Senior Geophysicist.

Melbourne.
August, 1955.



LEGEND

DIRECTION OF SLOPE

D1 DUMP

50 PARTS/MILLION COPPER

PLUS 900

200-900

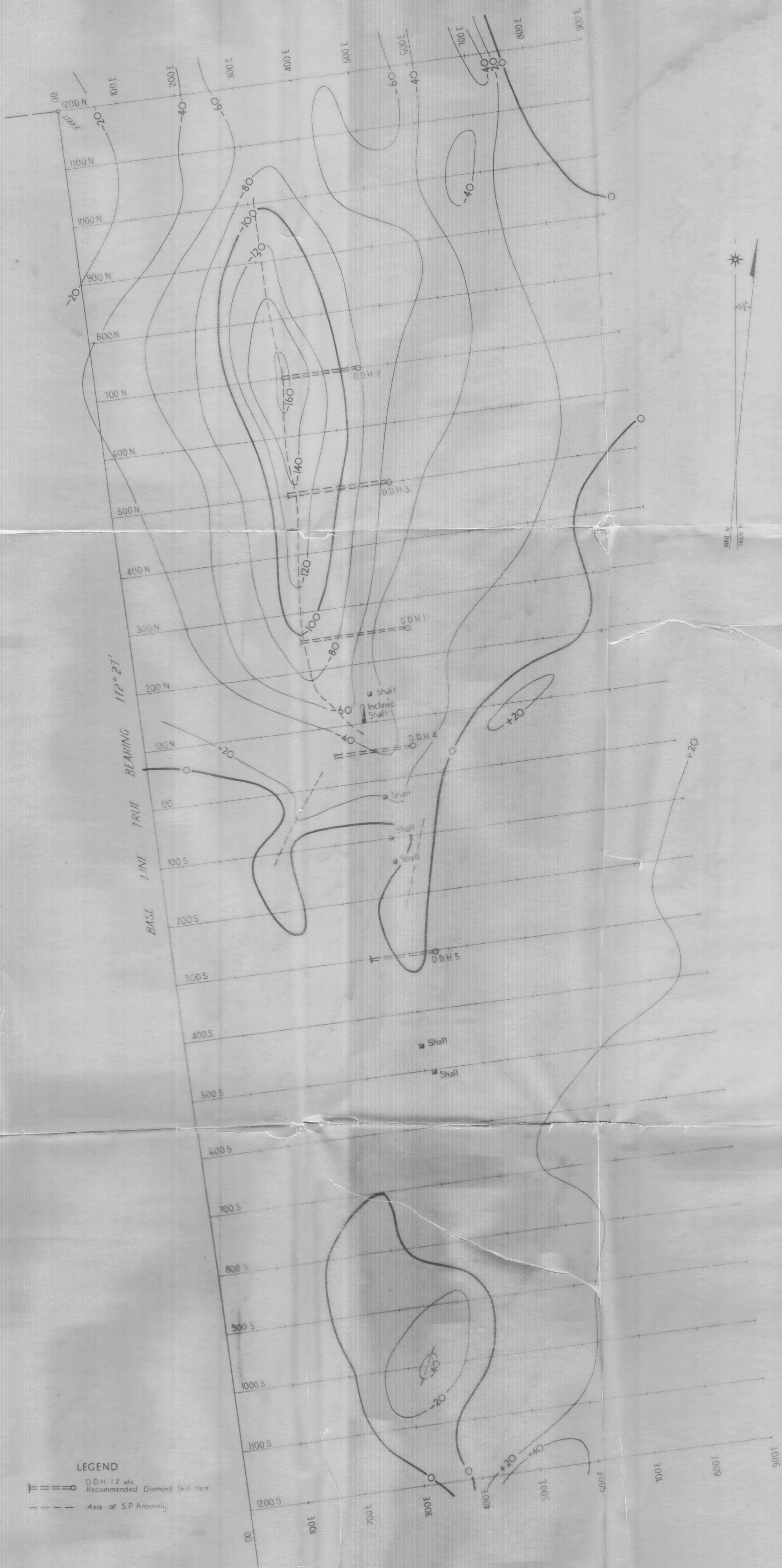
100-200

50-100

SCALE IN FEET

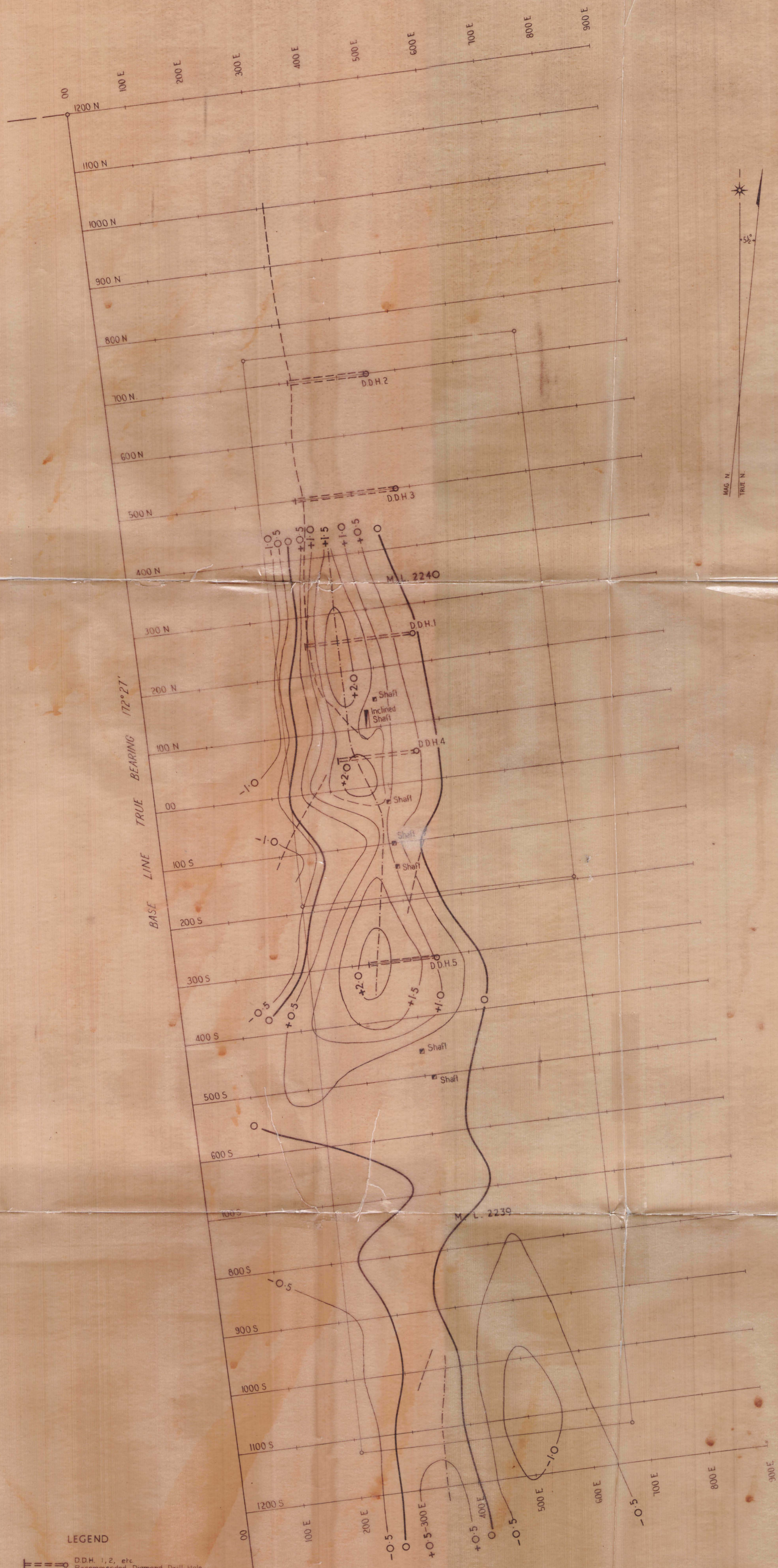
0 100 200

MT ISA MINES LIMITED GEOLOGICAL DEPARTMENT
DRAWING NO. O.49
CLONCURRY FIELD EXPLORATION
LABOUR-VICTORY COPPER MINE
COPPER GEOCHEMICAL SURVEY
APRIL 1955



GEOPHYSICAL SURVEY
LABOUR VICTORY MINE, NEAR SELWYN, QUEENSLAND.
SELF - POTENTIAL CONTOURS
CONTOUR INTERVAL 20 MILLIVOLTS

GEOPHYSICIST *J. Smith*



LEGEND

- DDH. 1, 2, etc.
Recommended Diamond Drill Hole
- Axis of S.P. Anomaly
- Axis of E.M. Anomaly

GEOPHYSICAL SURVEY

LABOUR VICTORY MINE, NEAR SELWYN, QUEENSLAND.

CONTOUR PLAN OF REAL HORIZONTAL COMPONENT
OF ELECTROMAGNETIC FIELD

(AFTER DEDUCTION OF FIELD DUE TO GENERAL GROUND CONDUCTIVITY)

CONTOUR INTERVAL 0.5 MICROGAUSS

SCALE



J. Smith
GEOPHYSICIST