

REPORT ON
TURAM ELECTROMAGNETIC AND
MAGNETOMETER SURVEYS
WATSON LAKE AREA, YUKON
ON BEHALF OF
SILVER DUKE MINES LTD. (N.P.L.)

by

Jon G. Baird, B.Sc., P.Eng.

May 31, 1968

CLAIMS:

<u>Name</u>	<u>Record Number</u>
MAX 1-12	17370 - 8 ²
MAX 14	1738 4
MAX 16	1738 6
MAX 18	1738 8
MAX 20	1739 0
MAX 22	1739 2
MAX 24	1739 4
MAX 43-48	Y22681-6
MAX 65-68	Y22703-6

LOCATION:

On Jane Creek, about 82 air miles
north of Watson Lake and 14 miles
due west of the Canada Tungsten
Highway, Southeastern Yukon.

61° 17' north latitude, 128° 44'
west longitude

DATES: May 7 to May 23, 1968

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	1" = $\frac{1}{2}$ mile
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	1" = 400'
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	1" = 400'

SUMMARY

A Turam electromagnetic survey on this property has not revealed any responses indicative of the presence of conductive bodies.

The magnetometer survey has revealed areas which may be underlain by intrusive rocks. As well, four localized areas of magnetic relief of about 1000 gammas may be indicative of the presence of lenses of magnetite which on this property may be associated with silver-lead-zinc mineralization.

A geologic examination of the areas interpreted to be underlain by intrusive rocks or magnetite lenses is recommended. This examination may be aided by trenching or drilling with a portable drill.

If these further investigations reveal that the magnetic survey is useful in outlining mineralized areas, further geophysical surveying may be warranted.

SEIGEL ASSOCIATES LIMITED

GEOPHYSICAL CONTRACTORS AND CONSULTANTS

STE. 115, 744 WEST HASTINGS STREET • VANCOUVER 1, BRITISH COLUMBIA • CANADA
TELEPHONE: 604-682-7701 • CABLE: "SEIGEO", VANCOUVER

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INTRODUCTION

During the period from May 7 to May 23, 1968, a geophysical field party under the direction of Mr. Armidas Lefebvre carried out linecutting as well as Turam electromagnetic and magnetometer surveys on some MAX claims north of Watson Lake, Yukon, on behalf of Silver Duke Mines Ltd. (N.P.L.).

The claim group is located at the head of Jane Creek, about 82 air miles north of Watson Lake. Access to the property was by helicopter from Watson Lake although some ferry trips were made from the Canada Tungsten Highway, about 14 miles to the east. Elevation on the claims surveyed ranges from 4500' to 6000'. Fine spring weather was experienced during the execution of the survey.

The "Turam" fixed source compensation method was chosen for the electromagnetic survey since, in comparison with other electromagnetic techniques, it is relatively unaffected by orientation errors caused by rough topography. As well, the Turam method provides deep penetration and allows accurate interpretation of anomaly characteristics. The attached copy of a paper by R. A. Bosschart and H. O. Seigel entitled "Some Aspects of the Turam Electromagnetic Method"

describes the equipment, the field procedures, the nature of results and the interpretative procedures involved in this type of survey.

Electromagnetic methods detect massive sulphide bodies by means of measurement of the secondary electromagnetic field produced by eddy currents. These secondary fields are measurable by a receiving unit. The Turam method employs a large closed loop of wire as transmitter, while the field strength ratio and phase difference at two nearby observation points are measured by means of two receiver coils.

The presence of a subsurface conductor will be indicated by abnormal field strength ratios and phase differences. A typical anomaly will show a correspondence between high values of the field strength ratio and negative phase differences. The depth of burial of the current axis is reflected in the shape of the anomaly, and the ratio of the maximum amplitudes of field strength and phase is a measure of the conductivity of the body.

As shown on Plate 1, a baseline 2.2 miles long and a sub-baseline .6 miles long were cut oriented N 40° E. Twenty-six miles of cross lines were then established at 400' intervals perpendicular to the baselines and for control, 5.6 miles of tie line were cut parallel to the baselines at the ends of the grid lines.

A Sharpe SE-700 instrument was employed with a receiving coil separation of 100'. For this survey, transmitting loops 4000' x 2000' and an operating frequency of 400 Hz were used. Readings were taken each 100' along the grid lines.

A Sharpe MF-1 fluxgate type magnetometer with a reading accuracy of about 5 gammas was used to measure the vertical component of

the earth's magnetic field at stations spaced 100' apart along the grid lines. In places where steep magnetic gradients were encountered, readings were taken each 50'.

GEOLOGY

The geology of the Silver Duke property is well described in a report by Douglas Parent, P.Eng., dated December 22, 1967. Other published references to the regional geology, all on the scale of 1" = 4 miles, are:

- Frances Lake, Y.T., Sheet 105H - Topographic Map
- Frances Lake, Y.T., Map 6-1966 Geologic Map
- Frances Lake, Y.T., Map 7007G, Aeromagnetic Map.

The property is underlain by Palaeozoic sedimentary and volcanic rocks invaded by granodioritic Cretaceous intrusives. The aeromagnetic map shows a circular magnetic high on the Max claims just north of the present survey area which may represent an intrusive rock type. Parent reports that in skarn zones magnetite has been found associated with "sphalerite, galena some chalcopyrite and an unidentified silver mineral."

DISCUSSION OF RESULTS

(a) Electromagnetic Survey

Plate 2 shows the results of the electromagnetic survey on a scale of 1" = 400'. The parameters plotted in profile form are the field strength ratios on a scale of 1" = 40% and the phase differences on a scale of 1" = 20°.

The profiles are seen to be very flat and uniform and usually within 1 or 2% of null response. There is no indication of any subsurface conductors.

(b) Magnetic Survey

Plate 3 is a contour map of the results of the magnetometer survey on a scale of 1" = 400'. Magnetic values are shown in gammas and the contour interval is 100 gammas.

Although the total relief over the area surveyed is about 2000 gammas, much of the area shows relatively low magnetic intensities and gentle relief.

The granodioritic intrusive rocks known to occur on the property are thought to have a higher magnetic susceptibility than the sediments and volcanics. Although these intrusives may occur at some depth, their presence may be indicated in areas where the magnetic intensities rise above about 400 gammas. These areas are shaded on Plate 3. The largest such area occurs on the west end of the grid although another is seen north of baseline 2 in the vicinity of line 100 E.

Sharp increases in the magnetic intensities of the order of 1000 gammas are annotated 'A' through 'D' and occur in the following places:

'A' - line 84E at Baseline 2

A maximum intensity of 1175 gammas is noted at the Baseline and is supported by observations north and south along line 84E. No anomalous indications are seen on flanking lines, however a steep magnetic gradient is noted between line 80E and 84E.

'B' - line 36E about 13 N

A maximum intensity of 1800 gammas occurs at station 13 N within a zone of intensities greater than 400 gammas 1500' in length which trends northwesterly off the grid. With the exception of the high readings on line 36 and one reading of 740 gammas at 17+50N on line 40E, no other observations greater than 700 gammas occur within the zone.

'C' - line 32E about 6 S

This area is characterized by an observation of 1615 gammas at 6 S and is supported by values in excess of 400 gammas extending from 3 S to 7 S along line 32E. No evidence of high readings is seen on flanking lines 400' on either side.

'D' - south ends of lines 36E through 48E

An area of high intensities is seen to occur at the south ends of lines 36E through 48E. This anomalous area is as yet not well defined and may be due to more than one magnetic body.

Since the above magnetic field distortions are observed for the most part on one profile line, quantitative interpretations cannot be reliably made. Anomaly C and the central part of Anomaly B, which suggest point sources, indicate maximum depths of 110' and 130' respectively. More accurate determinations could be made if these anomalies could be covered by a grid of closely spaced observations. The present data indicate that the present localized distortions of the magnetic field are likely due to small lenses containing magnetic minerals such as magnetite or perhaps pyrrhotite.

Three further areas of magnetic relief, labeled E, F and G, are noted. These indications are of lower amplitude and supported by fewer above normal observations than Zones 'A' through 'D'.

CONCLUSIONS AND RECOMMENDATIONS

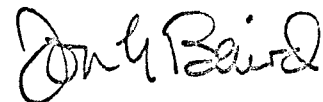
The electromagnetic survey has not indicated the presence of any conductors of potential interest. It is therefore concluded that the possibility can be ruled out that a body of massive sulphide mineralization having a strike length of at least 250' and a depth extent of at least 200' and coming to within about 250' of the ground surface exists within the area surveyed.

The magnetic survey has revealed four well defined areas where magnetite lenses which may represent skarn zones may occur. Since silver-lead-zinc mineralization has been found in such zones on the property, it is recommended that the areas of magnetic zones 'A' through 'G' be closely checked by surface prospecting and that a geologic map be prepared for the property. If no explanation for the observed responses is found at surface, drilling using a portable drill may be required. Precisely located diamond drill holes can be proposed on the basis of quantitative interpretation of magnetic data provided, however, as suggested above, many more observations taken on a closely spaced grid pattern would be available in the area of each anomaly.

If further work indicates that the magnetic pattern is indeed a guide to commercial-type mineralization, further magnetic surveying on the Max claims may be justified. If it appears that the present magnetic responses are due to small lenses of magnetite in what may be larger bodies of disseminated silver-lead-zinc mineralization, a limited amount of induced polarization surveying may be warranted.

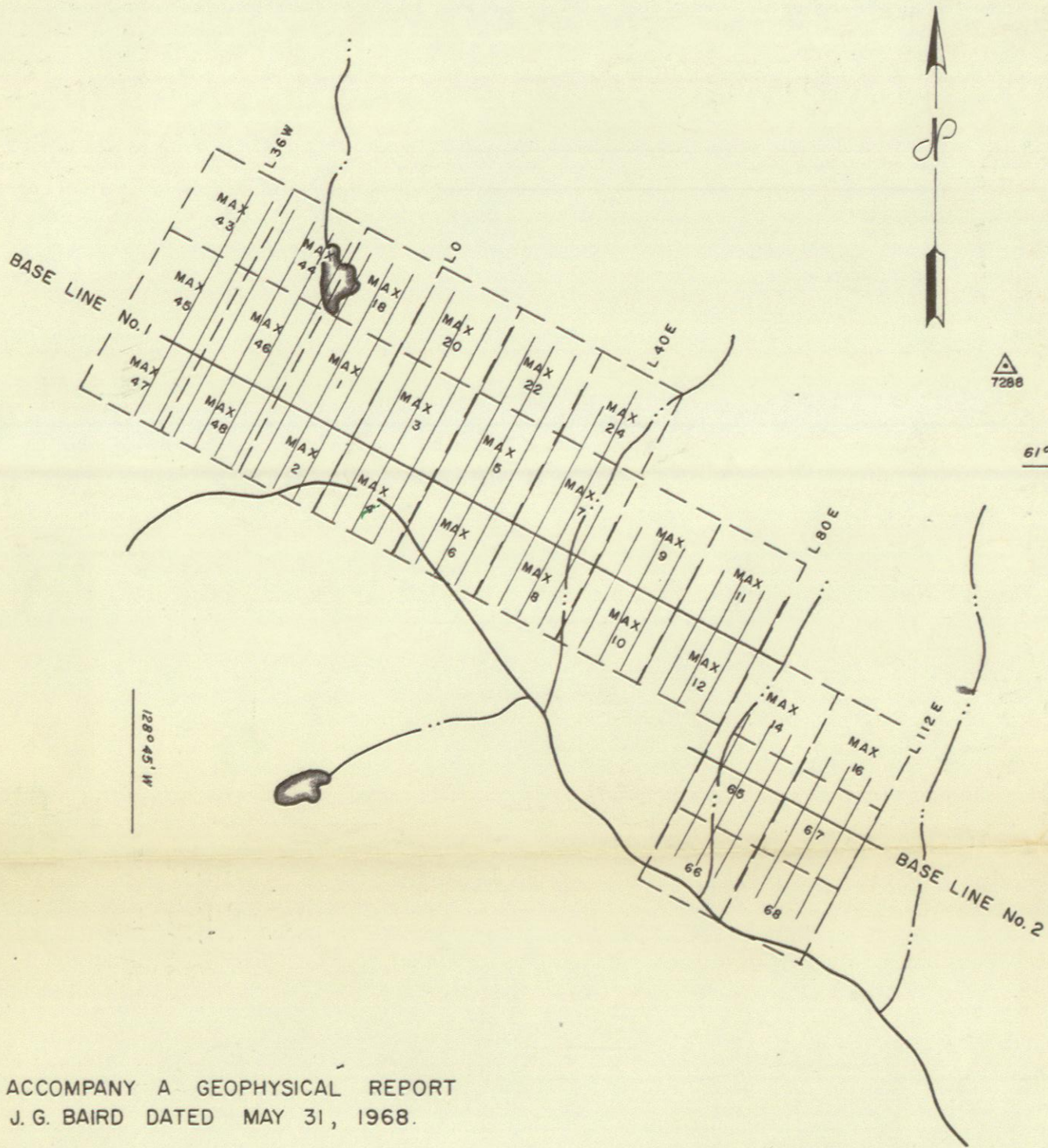
Respectfully submitted,

SEIGEL ASSOCIATES LIMITED



Jon G. Baird, B.Sc., P.Eng.
Geophysicist

Vancouver, B.C.
May 31, 1968.



TO ACCOMPANY A GEOPHYSICAL REPORT
 BY J.G. BAIRD DATED MAY 31, 1968.

PLATE I

SILVER DUKE MINES LTD.

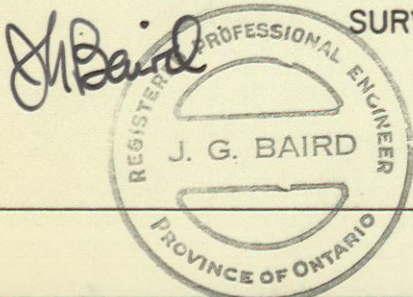
WATSON LAKE AREA, YUKON

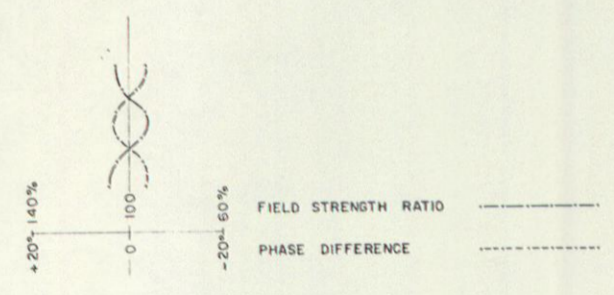
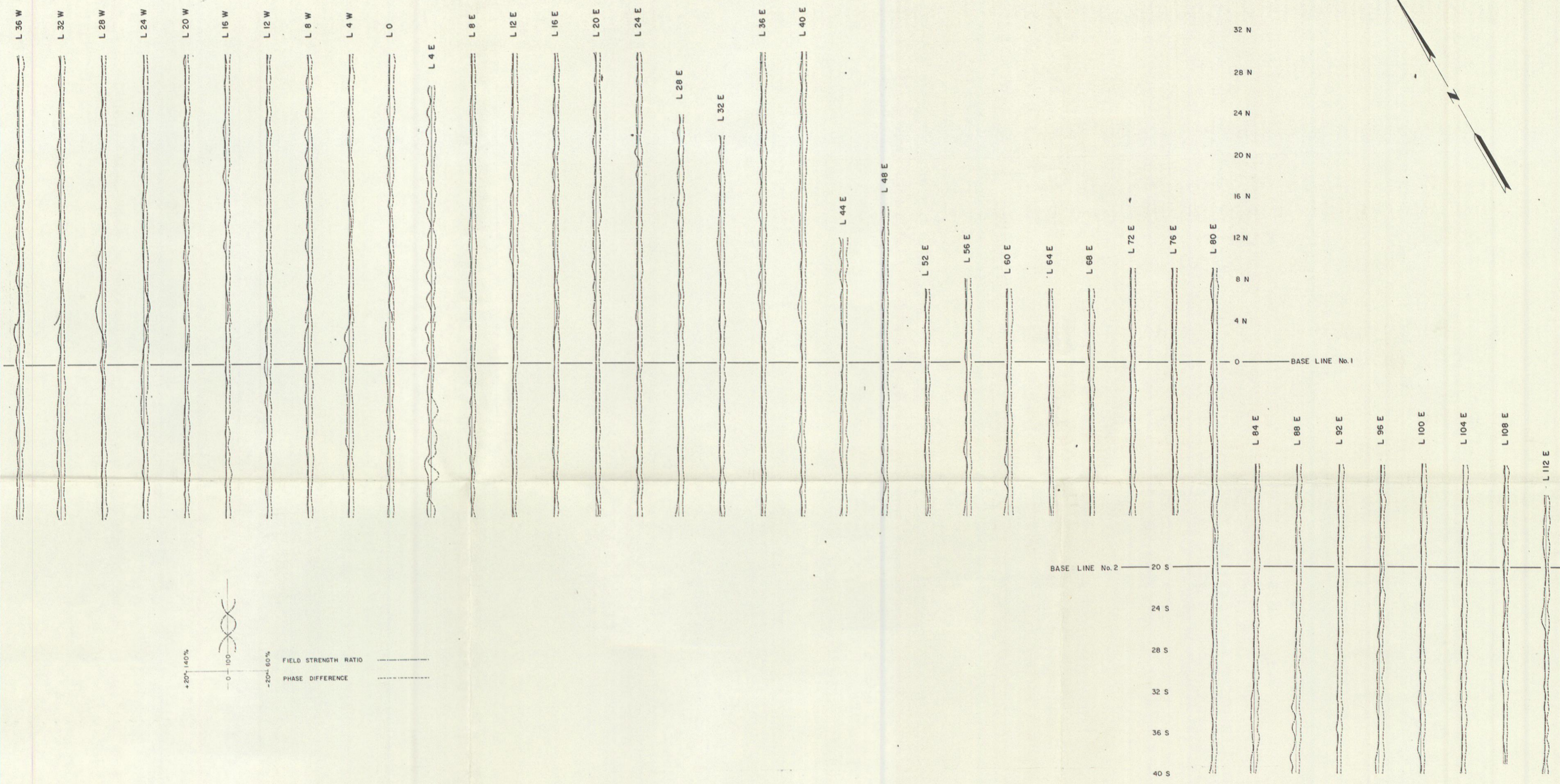
SURVEY GRID AND CLAIM LOCATION MAP

SCALE : 1" = 1/2 MILE

SURVEY BY SEIGEL ASSOCIATES LIMITED

MAY, 1968





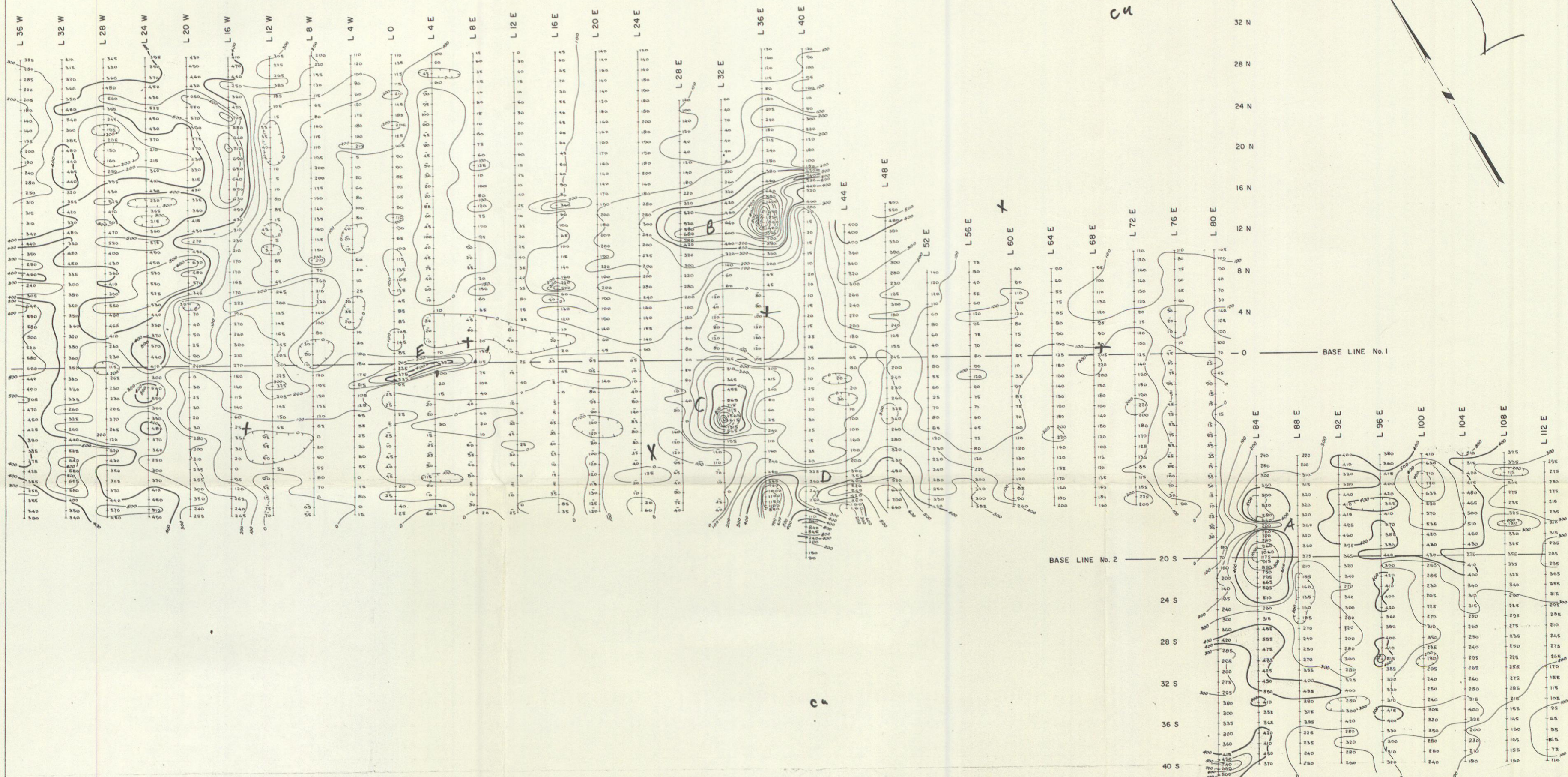
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PLATE 2
 SILVER DUKE MINES LTD.
 WATSON LAKE AREA, YUKON
 TURAM ELECTROMAGNETIC SURVEY
 SCALE: 1" = 400'





SURVEY BY SEIGEL ASSOCIATES LIMITED
 MAY, 1968

TO ACCOMPANY A GEOPHYSICAL REPORT
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LEGEND

-  LINE TRACE WITH MAGNETIC VALUES IN GAMMAS
-  GAMMA CONTOURS -100 THROUGH 1600 WITH 400 GAMMA CONTOUR HEAVY. 100 GAMMA CONTOUR INTERVAL

TO ACCOMPANY A GEOPHYSICAL REPORT
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COPY - REDUCED 50%

PLATE 3
SILVER DUKE MINES LTD.
WATSON LAKE AREA, YUKON
MAGNETOMETER SURVEY

SCALE: 1" = 400'
SURVEY BY SEIGAL ASSOCIATES LIMITED
MAY, 1968

