

GEOPHYSICAL REPORT

ON AN

INDUCED POLARIZATION SURVEY

CAPER CLAIM, MERRITT AREA

NICOLA M.D., B.C.

CAPER CLAIM : 24 km NW of Merritt
 : 50° 121° NW
 : N.T.S. 92I/7W

WRITTEN FOR : HERON RESOURCES LTD.
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DATED : June 15th, 1981

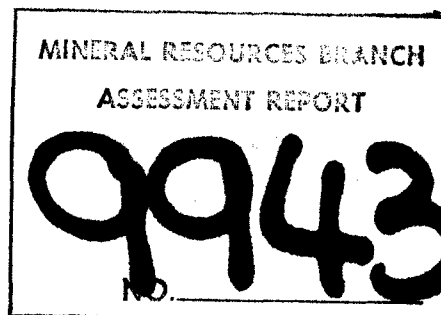


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 Engineering & Mining Geophysicists
 VANCOUVER, CANADA



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SUMMARY

From April to June, 1981 an induced polarization survey, and a small scale soil geochemistry survey were carried out over the CAPER Claim, on behalf of Heron Resources Ltd. The claim is located on Broom Creek, about 24 km NW of Merritt, B.C.

The Triassic sediments and volcanics in the area have been intruded by granodiorite which has been brecciated and altered in places. The copper mineralization, which is sometimes present in these zones, was the target of the survey work.

A grid system was laid out over the claim and frequency-domain I.P. readings and electrical resistivity readings were taken with a dipole-dipole array at four different electrode spacings. The results were plotted and contoured in both plan and section form. A limited number of soil samples were taken, to check the results from a previous survey. The samples were assayed for copper and silver.

CONCLUSIONS

1. Some small-scale anomalies were located, showing low to moderate I.P. effect.
2. The I.P. highs did not generally coincide with resistivity lows, as might be expected if the I.P. response is caused by high grade mineralization. Even in the absence of an I.P. anomaly, the resistivity anomalies may be significant and consideration should be given to their investigation.
3. The results of the geochemical survey did not, in general, correspond well with the previous soil sampling survey. The

most likely reason is a discrepancy between the two survey grids. Some very good copper and silver values were revealed by the present survey.

RECOMMENDATIONS

The I.P. anomalies should be investigated by drilling according to the following priority: anomaly b, anomaly f and anomaly a.

A decision to drill I.P. anomalies c, d and e, or to drill any of the resistivity lows, should be taken in the light of the initial drilling program.

Further localized geochemical sampling should be considered over the geophysical anomalies.

GEOPHYSICAL REPORT

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INDUCED POLARIZATION SURVEY

CAPER CLAIM, MERRITT AREA

NICOLA M.D., B.C.

INTRODUCTION AND GENERAL REMARKS

This report discusses the survey procedure, compilation of data and the interpretation of an induced polarization (I.P.) survey and soil sampling survey conducted over the CAPER Claim, near Merritt, B.C. on behalf of Heron Resources Ltd.

The work was carried out in several phases, between 29th April and 11th May, on 20th May and 24th May, all under the supervision of Michael H. Rogers, Geophysicist, and from 3rd to 6th June, 1981, under the supervision of David G. Mark, Geophysicist, and the field leadership of John Ashenhurst.

The purpose of the work was to locate probable areas of sulphide mineralization, as a follow-up to a 1980 soil geochemistry survey on the property that revealed several very strong anomalies in copper with associated silver and gold values.

The use of the I.P. method was recommended by Kerr Dawson and Associates Ltd. in their report on the geochemical work.

PROPERTY AND OWNERSHIP

The property comprises one claim of nine units, staked under the Modified Grid System.

<u>Claim Name</u>	<u>No. of Units</u>	<u>Record No.</u>	<u>Expiry Date</u>
CAPER	9	185	October 7, 1987

The property is owned by Heron Resources Ltd., of Vancouver, British Columbia.

LOCATION AND ACCESS

The claim is located on Broom Creek, about 24 km NW of Merritt. The geographical coordinates are $50^{\circ} 20' N$ and $120^{\circ} 53' W$.

Access to the property is gained by turning off the Craigmont Mines road which branches off the Merritt to Spences Bridge road at Lower Nicola. The total distance by road from Merritt is approximately 35 km.

PHYSIOGRAPHY

The property is located on the Thompson Plateau which forms part of the Interior Plateau region of the Canadian Cordillera.

Broom Creek flows diagonally across the claim, incising a steep-walled valley.

Total relief on the claim is about 300 m (1,100 to 1,400 m a.s.l.) The area is covered by secondary forest with scrub and deadfall.

HISTORY OF PREVIOUS WORK

Many trenches and adits are visible on the property, as evidence of considerable past exploration activity, dating back to the turn of the century. Over the past 20 years, localized geochemical and geophysical (I.P.) surveying, plus aditing and diamond drilling, has been carried out in what was believed to be the principal mineralized zone on the claim. This area has not been covered by the present survey.

A geochemical survey was carried out over the claim in October, 1980. (1)

GEOLOGY

The geology of the area is described by W.J. McMillan (2). Various phases of granodiorite have intruded the volcanics and sediments of the Triassic Nicola Group. There are zones in the granodiorite where faulting and brecciation have occurred. These zones show alteration (sericitization, chloritization etc.), plus the development of copper mineralization in the form of malachite and chalcocite.

INSTRUMENTATION

The induced polarization equipment was frequency-domain type manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. A 12-volt lead-acid battery was used to give a power source potential of 500 watts.

The transmitter output is 125, 250, 375 or 500 volts with selection by a switch, and the transmitted current varied up to 1,000 milliamperes, depending on ground conditions. The self-potential buckout is operated manually by a 10-turn

precision pot with a range of ± 1 volt.

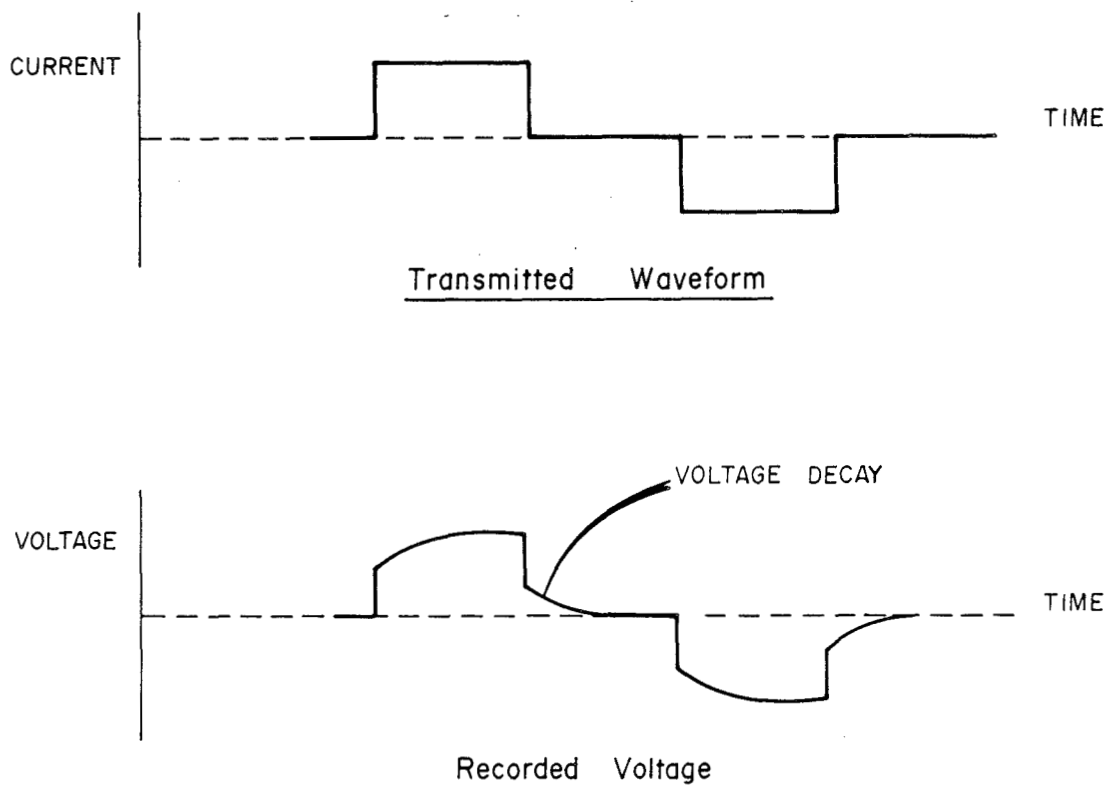
In frequency-domain I.P. surveying, current is transmitted at two different frequencies, eg. 0.3 Hz and 10 Hz. At each of these, the voltage induced between the two potential electrodes is measured, and the difference between the two readings expressed as a percentage.

THEORY

When a voltage is applied to the ground, electric current flows, mainly in the electrolyte-filled capillaries in the rock. If the capillaries also contain certain mineral particles that transport current by electrons (most sulphides, some oxides and graphite), then ionic charges build up at the particle-electrolyte interface, positive ones where the current enters the particle and negative ones where it leaves. This accumulation of charge creates a voltage that tends to oppose the current flow across the interface. When the current is switched off, the created voltage slowly decreases as the accumulated ions diffuse back into the electrolyte. This type of induced polarization phenomenon is known as electrode polarization.

A similar effect occurs if clay particles are present in the conducting medium. Charged clay particles attract oppositely-charged ions from the surrounding electrolyte; if a current is induced then the charged ions are displaced. When the current stops, the ions slowly diffuse back to their equilibrium state. This process is known as membrane polarization and gives rise to induced polarization effects even in the absence of metallic-type conductors.

Most I.P. surveys are carried out by taking measurements in the "time-domain" or the "frequency-domain".



Time-domain measurements involve sampling the waveform at intervals after the current is switched off, to derive a dimensionless parameter, the chargeability, M which is a measure of the strength of the induced polarization effect. Measurements in the frequency-domain are based on the fact that the resistance produced at the electrolyte-charged particle interface decreases with increasing frequency. The difference between apparent resistivity readings at a high and low frequency is expressed as the percentage frequency effect (PFE).

The two I.P. response parameters, M and PFE are nearly proportional at fairly low polarization values. In the absence of large membrane polarization effects, high M or PFE values may indicate the presence of disseminated sulphide mineralization.

In the process of carrying out an I.P. survey, two other sets of readings are taken; these are resistivity and self-potential (S.P.). The S.P. is a measurement of the "battery-action" of the ground, caused by current flows set up by near-surface oxidation processes. The resistivity is a measure of how well the ground conducts electricity, and depends mainly on saturation and the ionic and clay particle content of the pore waters.

SURVEY PROCEDURE

The dipole-dipole array was used with an "a" value (dipole length) of 50 m and four separations, $n = 1, 2, 3$ and 4 , i.e. 50, 100, 150 and 200 m.

Stainless steel stakes were used for current electrodes. The potential electrodes comprised metallic copper in copper sulphate solution, in non-polarizing, unglazed, porcelain pots.

Readings of PFE were taken every 50 m along 8 north-south lines.

Soil samples were taken from the B horizon along selected parts of the survey grid, where the previous geochemical survey had revealed highly anomalous copper values. The 110 samples were assayed by General Testing Laboratories of Vancouver,

using the following procedure: each sample was thoroughly dried, then sifted through a -80 mesh screen; a measured amount was mixed and heated with aqua regia. The proportion of copper and silver in the sample was then measured by atomic absorption.

COMPILATION OF DATA

The PFE values are read directly from the instrument and no data processing is therefore required prior to plotting. The resistivity values are derived from current and voltage readings taken in the field. These values are combined with the geometrical factor appropriate for the dipole-dipole array, to compute the apparent resistivities.

The geophysical data has been presented in two forms. The percentage frequency effect and apparent resistivity results for $n = 1$ and 3 are shown in plan form on Sheets 1, 2, 3 and 4 respectively, with the values being plotted at the mid point of the two dipoles. An alternative presentation is the pseudo-section, where the figures are plotted at the intersection of lines drawn from each dipole at 45° to a horizontal line. The I.P. values are plotted below the line, and the resistivity values (as a mirror image), above the line (Sheet 5).

Soil copper content and soil silver content have been shown on Sheets 6 and 7.

RESULTS

Geochemistry

The results of the copper and silver soil content analyses have been plotted on Sheets 6 and 7 respectively. For comparison, the anomalous areas defined by the previous survey

have been outlined on the same plan, assuming that the sampling grids are the same. (The old grid markers had disappeared since the 1980 survey, so it was not possible to check the relative position of the grids.)

Good copper and silver values are revealed by the present survey, especially along lines 4+00W, the northern part of 2+00W and the southern end of line 3+00W. Correlation with the previous survey is poor, presumably because of differences between the two grids.

Geophysics

The I.P. survey revealed several anomalous areas, with PFE values in excess of 4%. These have been labelled on Sheets 1, 2 and 5 as anomalies a, b, c, d and e.

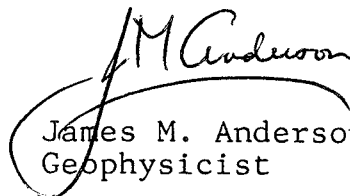
Anomaly a This feature appears on lines 4W and 5W, and can probably be extrapolated across to line 8W. It contains some quite high I.P. responses (up to at least PFE = 9), and has some depth extent. There is no associated resistivity low - in fact, the resistivity values are anomalously high in this region, possibly indicating a change in rock type.

Anomaly b This anomaly, although quite small, is of particular interest as it coincides with the strong copper anomaly revealed by the soil geochemical work.

Anomalies c, d and e These are low amplitude features with no obvious associated resistivity lows. The geochemical surveys revealed several anomalies in the general area. Anomaly e may be a continuation of anomaly c.

Anomaly f This anomaly includes PFE values up to 6, and it can be traced across two lines. It coincides with a zone of low resistivity, which is an encouraging sign.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.


James M. Anderson,
Geophysicist

June 15th, 1981

SELECTED BIBLIOGRAPHY

- (1) John R. Kerr Geochemical Report on the Caper Claim, Kerr, Dawson and Associates Ltd., 1981
- (2) W.J. McMillan et al BCDM Preliminary Map Sheet #30 (1:100,000 scale), Geology of the Guichon Creek Batholith and Highland Valley, Porphyry Copper District, British Columbia, 1978.

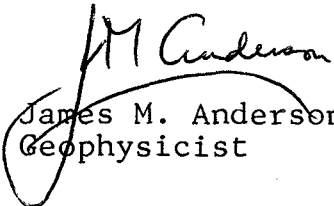
GEOPHYSICIST'S CERTIFICATE

I, JAMES M. ANDERSON, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of Geotronics Surveys Ltd., with offices at 403-750 West Pender Street, Vancouver, British Columbia.

I further certify:

1. That I am a graduate of the University of Tasmania (1971), and hold a B.Sc. degree in Geophysics.
2. That I have been practising my profession for the past ten years.
3. This report is compiled from data obtained from induced polarization and soil geochemistry surveys carried out under the direction of David G. Mark, Geophysicist, and the field supervision of J. Ashenhurst in April, May and June, 1981.
4. I have no direct or indirect interest in the CAPER Claims nor in Heron Resources Ltd., nor do I expect to receive any interest as a result of writing this report.


James M. Anderson
Geophysicist

June 15th, 1981

AFFIDAVIT OF EXPENSES

This is to certify that I have caused to be done on the Caper Claim near Merritt in the Nicola Mining Division, British Columbia an induced polarization survey to the value of the following:

FIELD:

5-man crew and instrument, 15 days at \$1,000/day	\$15,000	
5-man crew and instrument, 4 days standby rate, \$600/day	2,400	
Room and board, 19 days at \$230/day	4,370	
Truck rental and gas, 4-wheel drive, 19 days at \$80/day	1,520	
Survey supplies	<u>140</u>	\$23,430

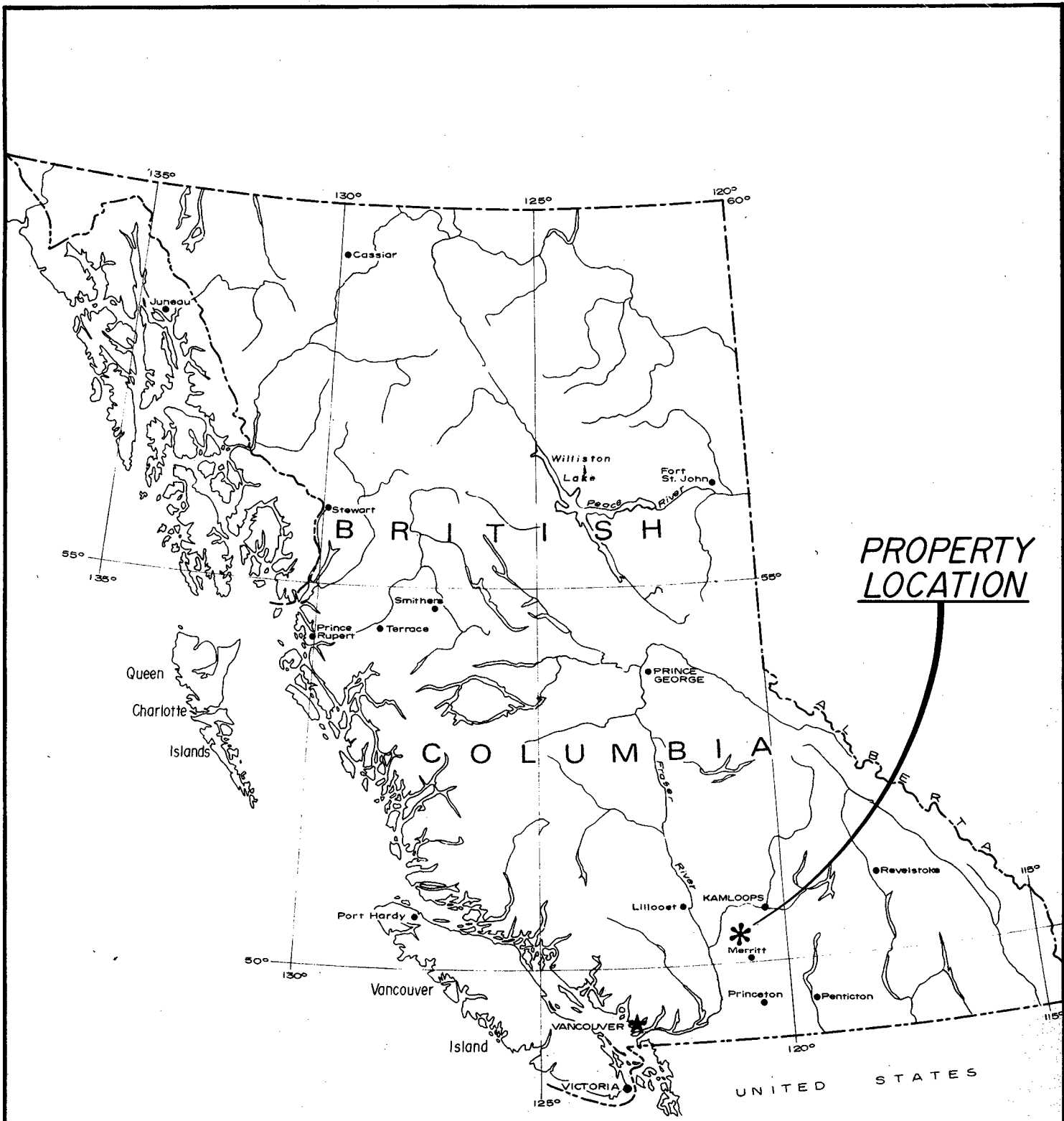
OFFICE:

Geophysicist, 20 hours at \$40/hour	\$ 800	
Geophysical technician, 22 hours at \$25/hour	550	
Drafting and printing	852	
Typing, photocopying and compilation	<u>150</u>	<u>2,352</u>
		<u>\$25,782</u>

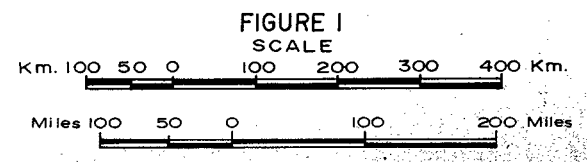
Respectfully submitted,
GEOTRONICS SURVEYS LTD.

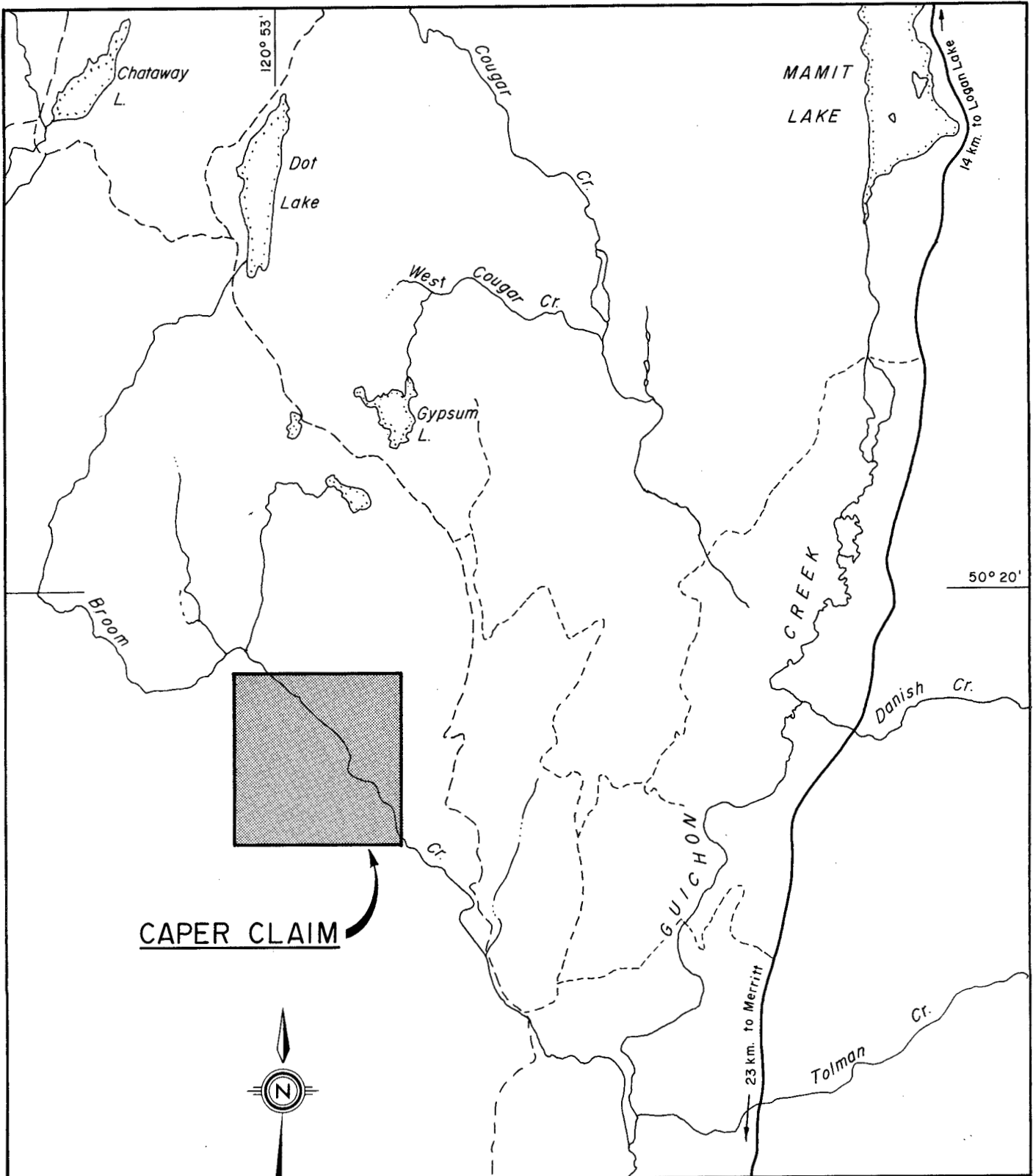


David G. Mark, Manager
Geophysicist



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CAPER CLAIM
 NICOLA M.D., B.C.
LOCATION MAP





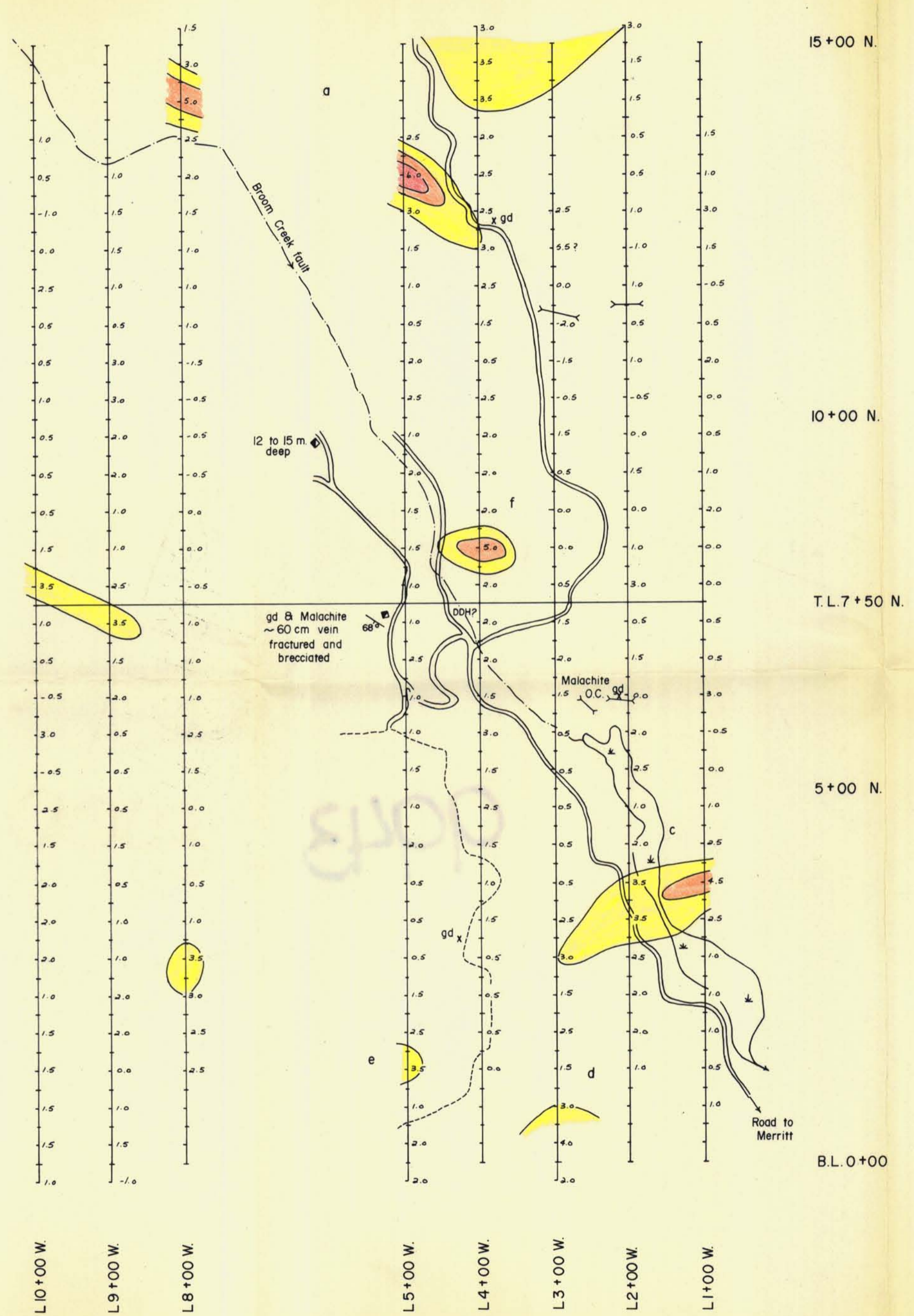
CAPER CLAIM



SCALE



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CAPER CLAIM			
MERRITT AREA, NICOLA M.D., BC.			
CLAIM MAP			
JOB No. 81 - 19	DATE: JUNE, 1981	SCALE: 1 : 50,000	FIGURE 2



ddsfB

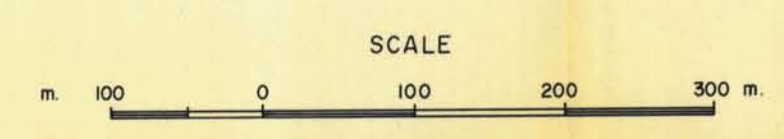
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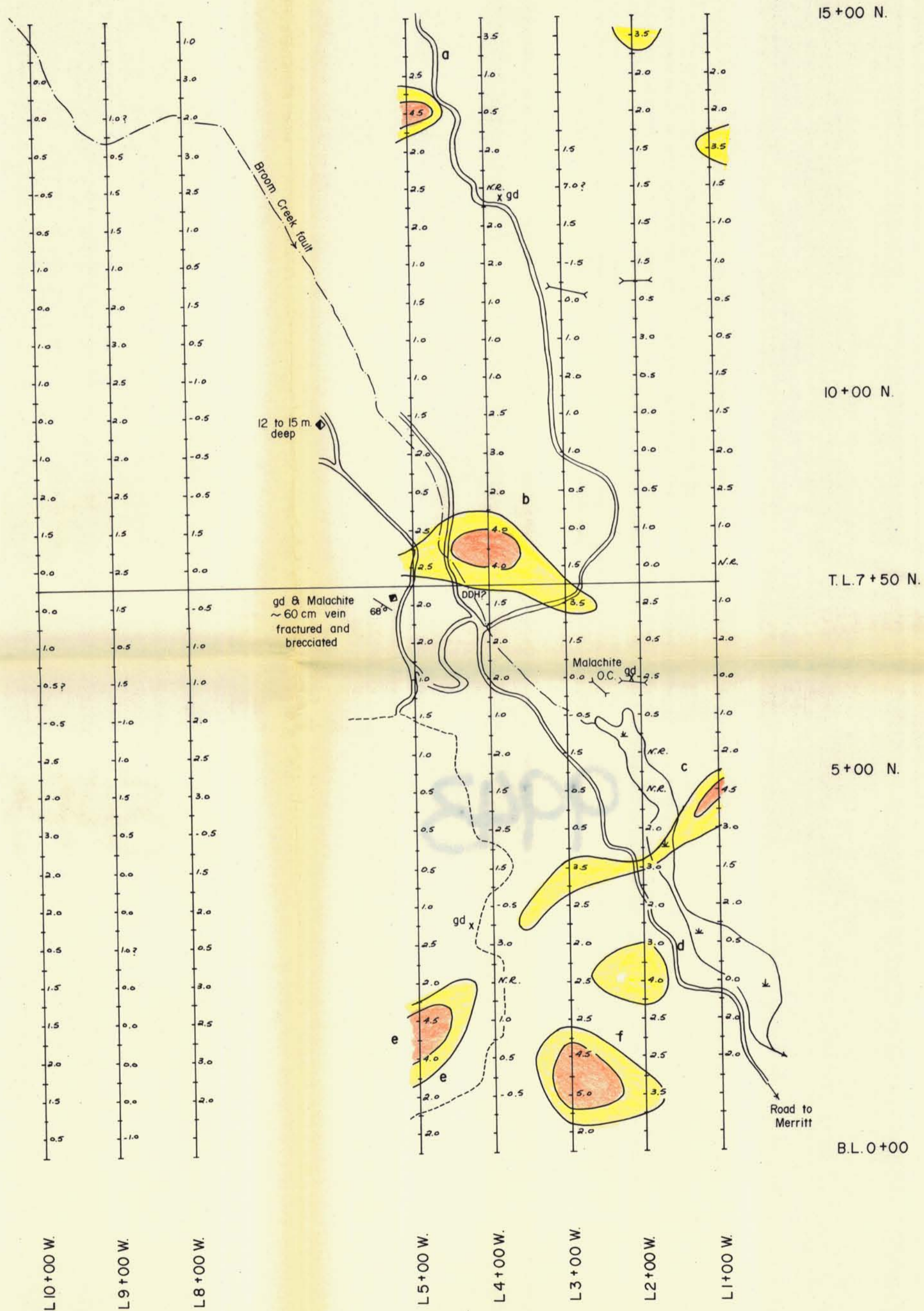
MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
9943

- LEGEND
- SHAFT
 - TRENCH
 - x OUTCROP AREA
 - 68° STRIKE & DIP
 - DDH DIAMOND DRILL HOLE
 - gd GRANODIORITE
 - ROAD
 - - - SKIDDER TRAIL
 - ~ STREAM
 - ⌵ SWAMP
 - a INTERPRETED ANOMALIES
 - 3.5 PERCENTAGE FREQUENCY EFFECT (PFE) VALUE.
- CONTOURS = 3.0, 4.0, 5.0

To accompany geophysical report by J.M. Anderson, Geophysicist.

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HERON RESOURCES LTD.			
CAPER CLAIM			
MERRITT AREA, NICOLA MD, BC.			
INDUCED POLARIZATION SURVEY			
PERCENT FREQUENCY EFFECT FOR n=1			
DATA & CONTOURS			
JOB NO.:	DATE:	SCALE:	SHEET NO.:
81-19	JUNE, 1981.	1:5000	1





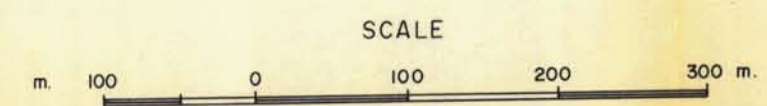
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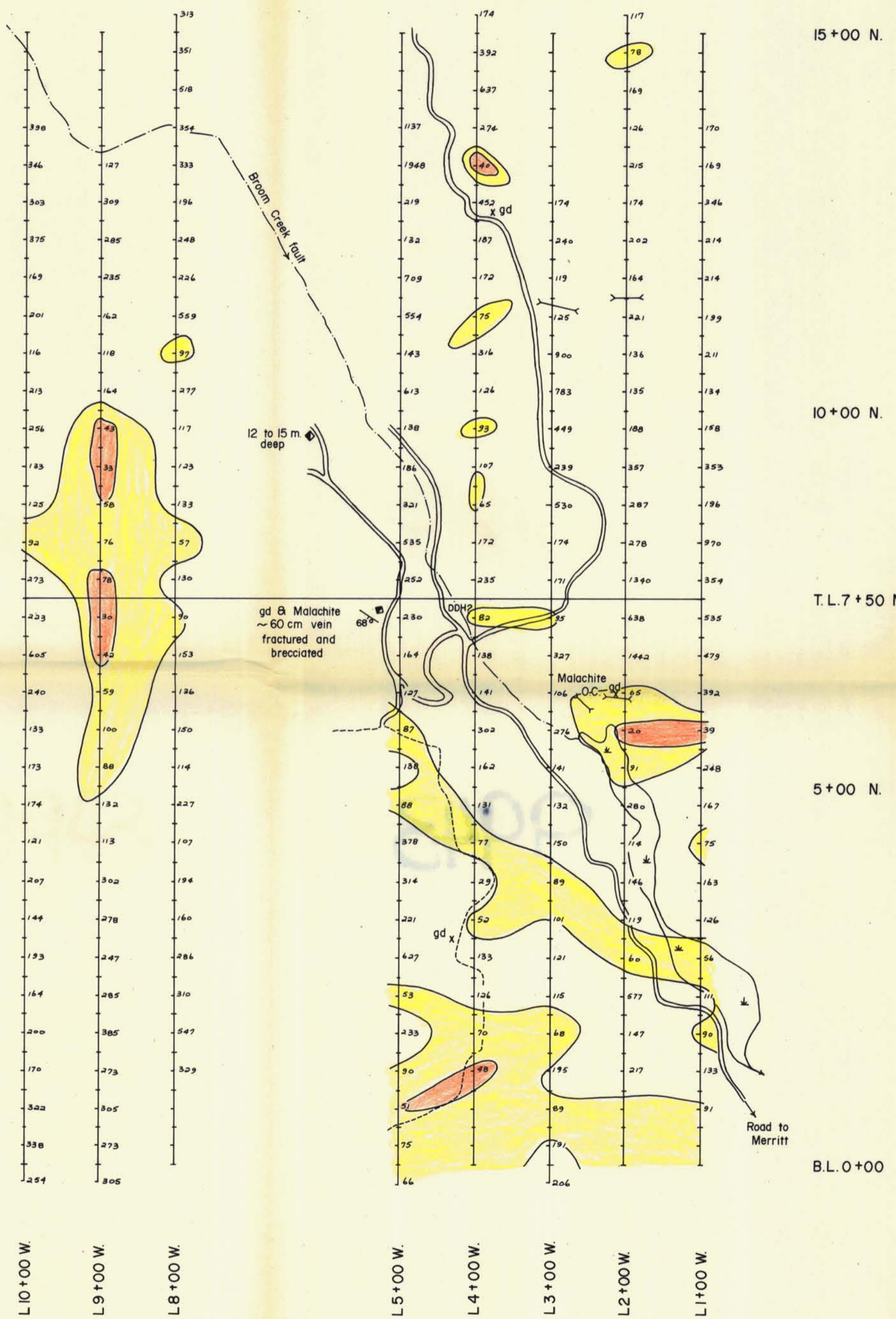
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ASSESSMENT REPORT
9943
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- LEGEND
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- CONTOURS = 3.0, 4.0, 5.0

To accompany geophysical report by J.M. Anderson, Geophysicist.

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HERON RESOURCES LTD.			
<u>CAPER CLAIM</u>			
MERRITT AREA, NICOLA MD., BC.			
<i>INDUCED POLARIZATION SURVEY</i>			
<i>PERCENT FREQUENCY EFFECT FOR n=3</i>			
<i>DATA & CONTOURS</i>			
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81-19	JUNE, 1981	1:5000	2





LEGEND

- SHAFT
 - TRENCH
 - x OUTCROP AREA
 - 68° STRIKE & DIP
 - DDH DIAMOND DRILL HOLE
 - gd GRANODIORITE
 - ROAD
 - - - SKIDDER TRAIL
 - ~ STREAM
 - ⋆ SWAMP
- 126 APPARENT RESISTIVITY VALUE (OHM-M)
 CONTOURS AT 100 AND 50 Ω m

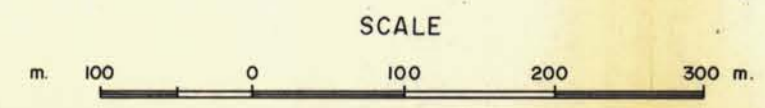
BRANCH
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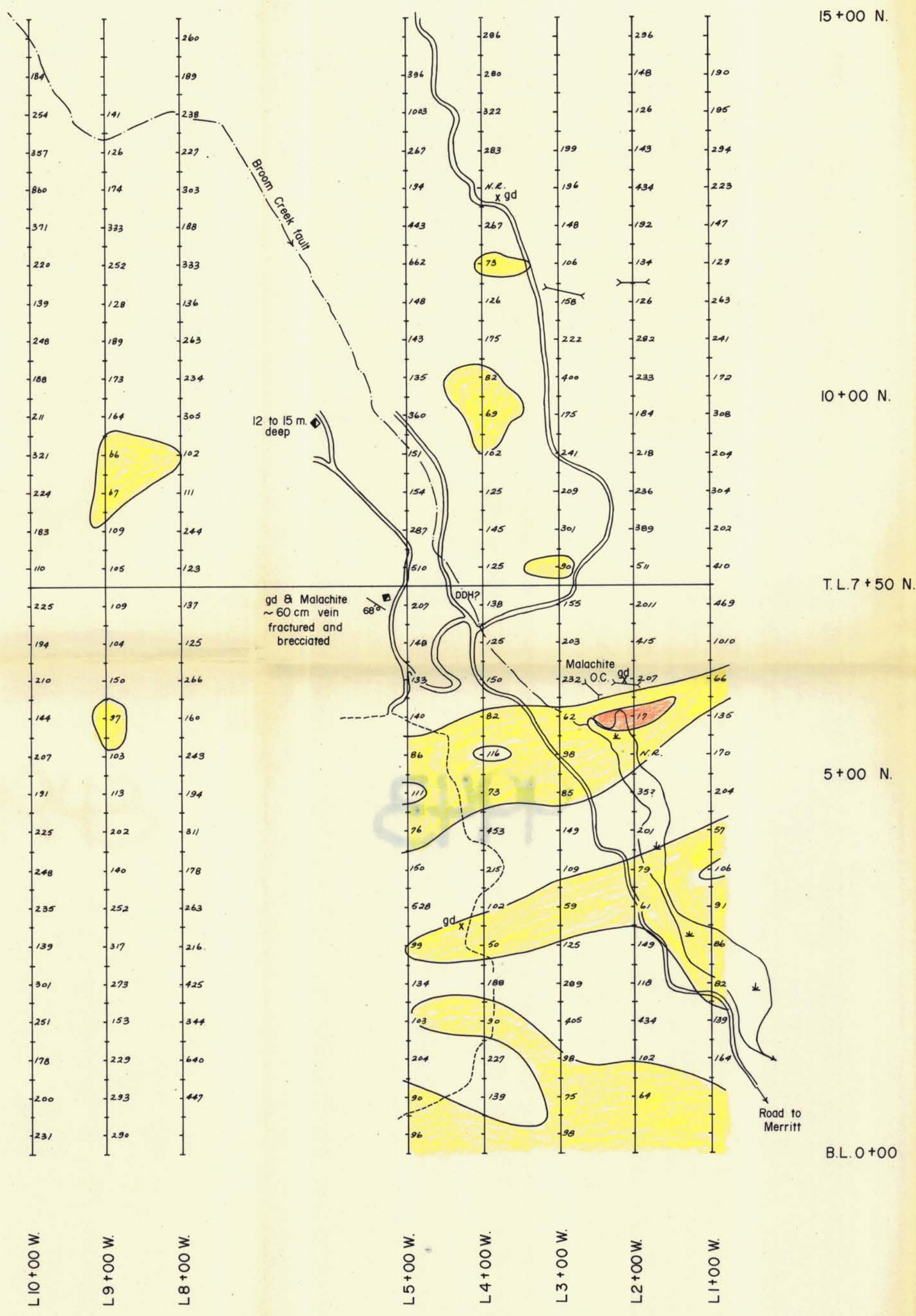
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 CAPER CLAIM
 MERRITT AREA, NICOLA MD., BC.

INDUCED POLARIZATION SURVEY
 APPARENT RESISTIVITY FOR $n=1$
 DATA & CONTOURS

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81-19	JUNE, 1981.	1:5000	3





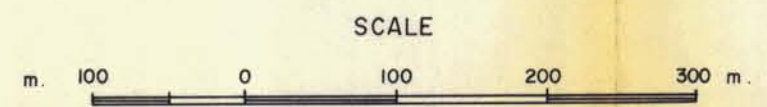
LEGEND

- SHAFT
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 - gd GRANODIORITE
 - ROAD
 - - - SKIDDER TRAIL
 - ~ STREAM
 - ⊥ SWAMP
- 100 APPARENT RESISTIVITY VALUE (OHM-M)
 CONTOURS AT 100 AND 50 Ω m

MERRITT BRANCH
 ASSESSMENT REPORT
9943
 NO.

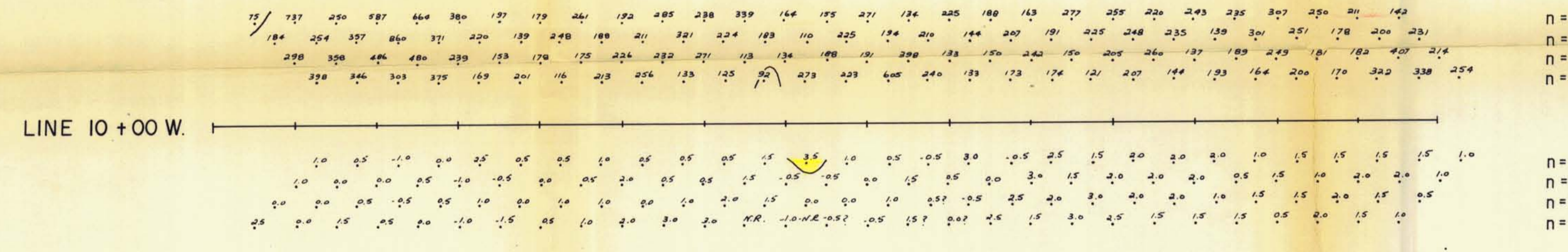
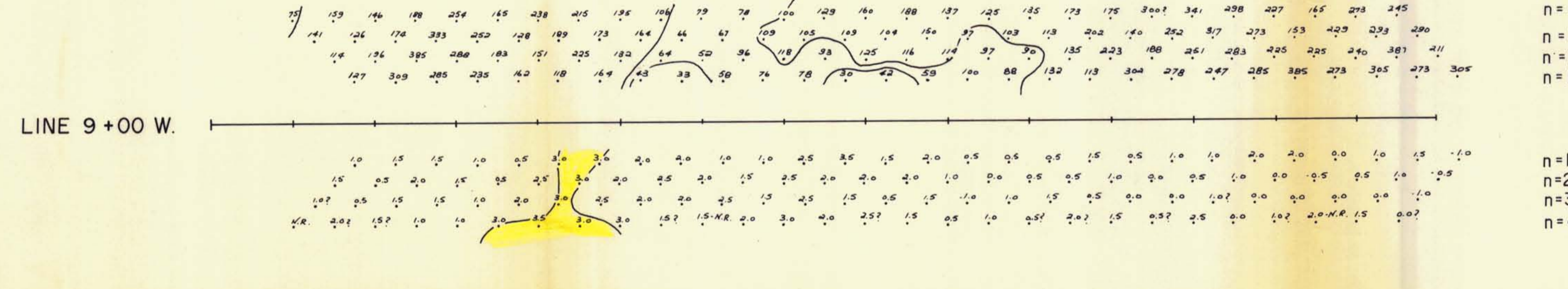
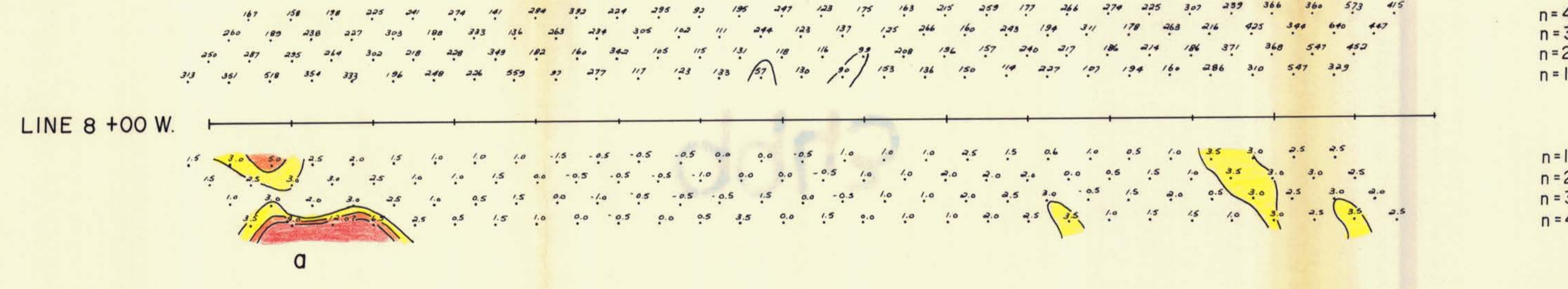
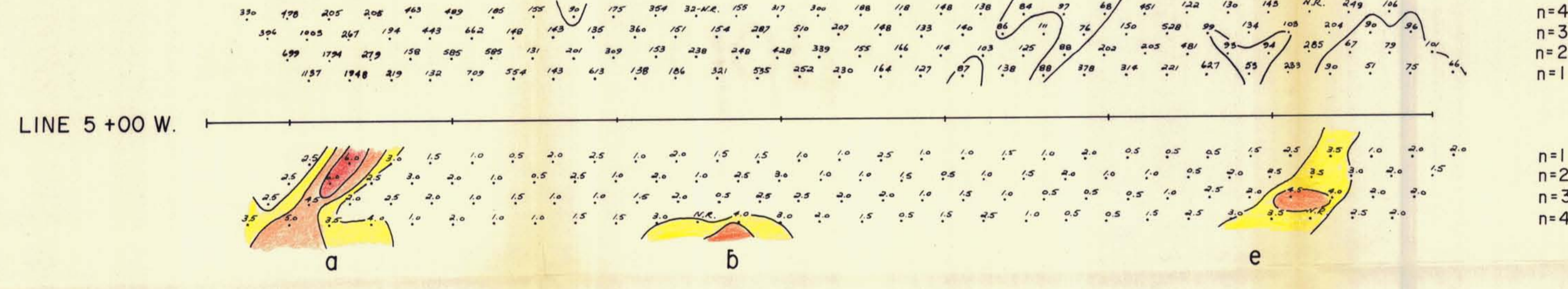
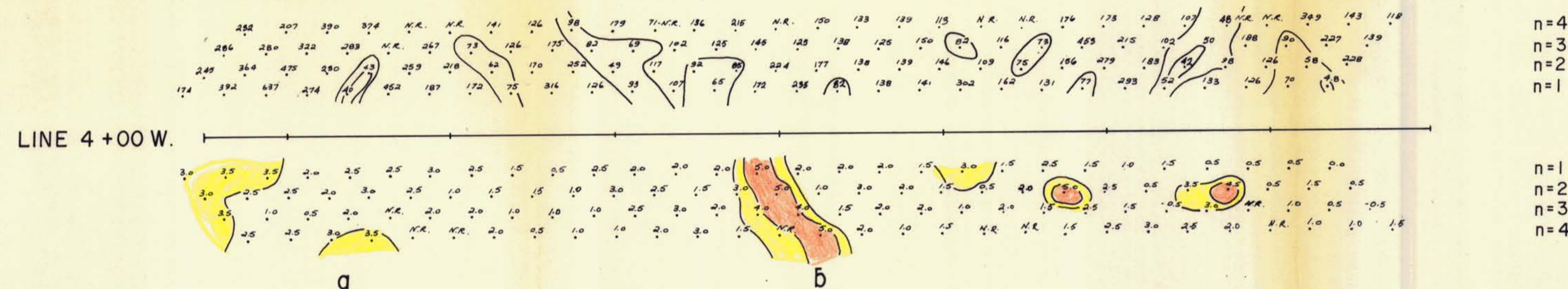
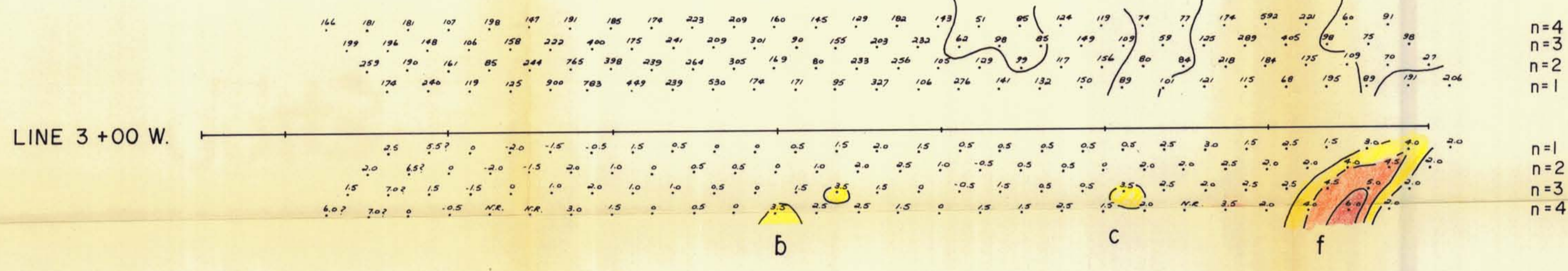
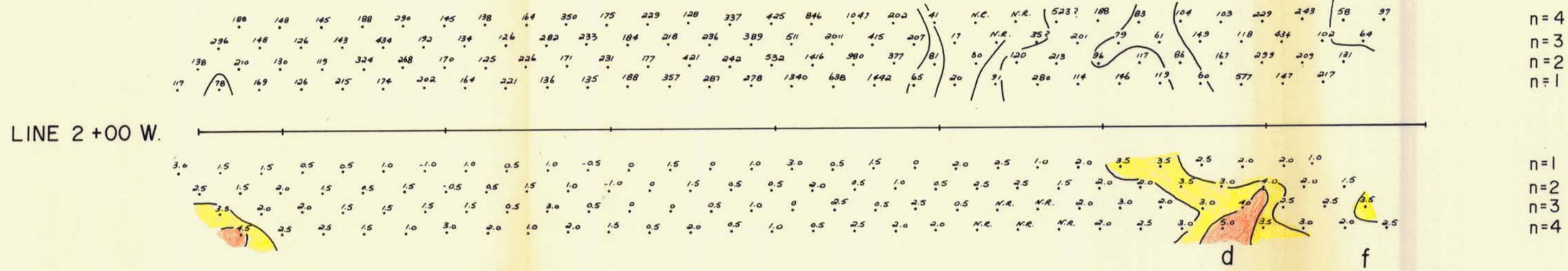
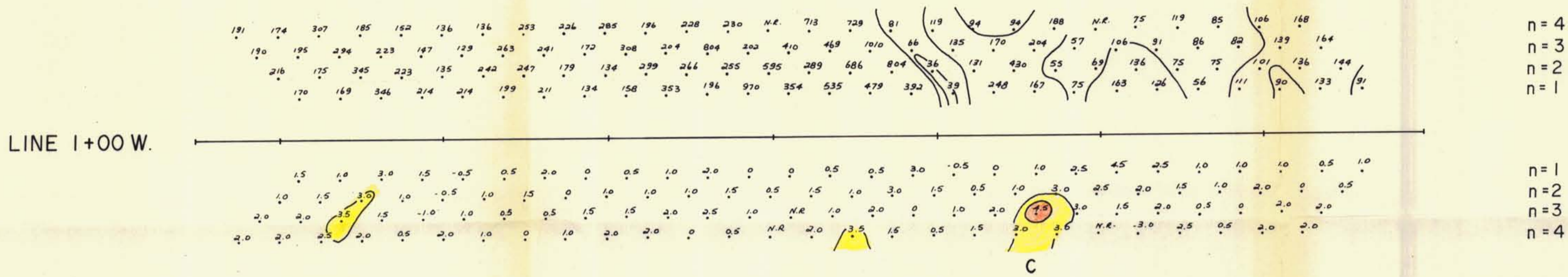
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HERON RESOURCES LTD.			
<u>CAPER CLAIM</u>			
MERRITT AREA, NICOLA M.D., B.C.			
<i>INDUCED POLARIZATION SURVEY</i>			
<i>APPARENT RESISTIVITY FOR n=3</i>			
<i>DATA & CONTOURS</i>			
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81-19	JUNE, 1981.	1:5000	4



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14+00 N. 12+00 N. 10+00 N. 8+00 N. 6+00 N. 4+00 N. 2+00 N. B.L.O+00 N.



14+00 N. 12+00 N. 10+00 N. 8+00 N. 6+00 N. 4+00 N. 2+00 N. B.L.O+00 N.

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
9943
NO.

EXPP

LEGEND

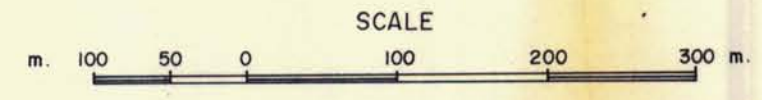
INDUCED POLARIZATION (Plotted below line)

- ± Percent Frequency Effect Values
- ± Doubtful Reading
- N.R. No Reading Obtainable
- Contours at 3.0, 4.0 and 5.0

RESISTIVITY (Plotted above line)

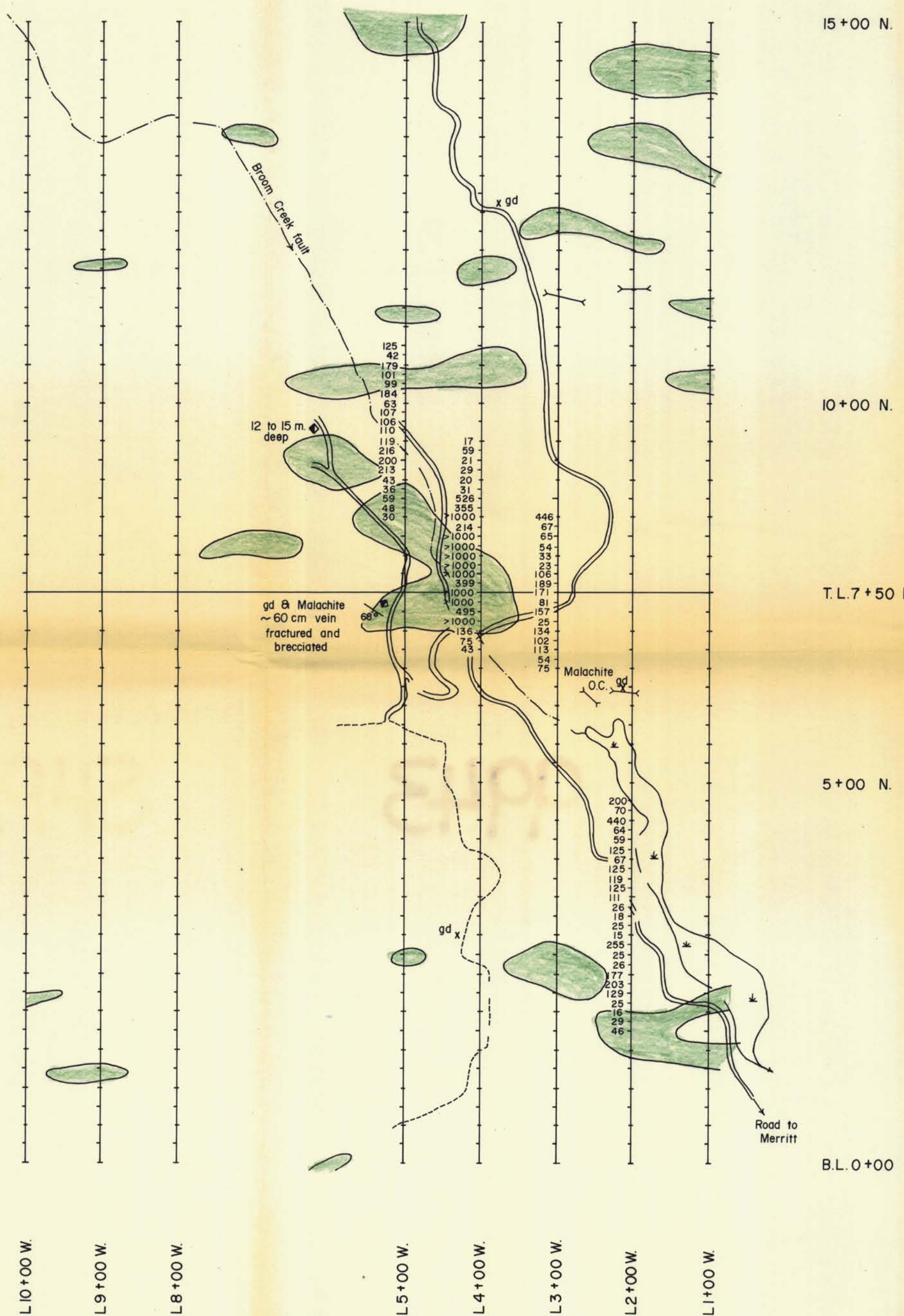
- ± Apparent Resistivity (Ω-m)
- Contours at 50 and 100

± INTERPRETED ANOMALIES



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CAPER CLAIM			
MERRITT AREA, NICOLA, B.C.			
INDUCED POLARIZATION SURVEY			
PSEUDO-SECTIONS			
DATA & CONTOURS			
JOB NO: 81-19	DATE: JUNE, 1981	SCALE: 1:5000	SHEET NO.: 5



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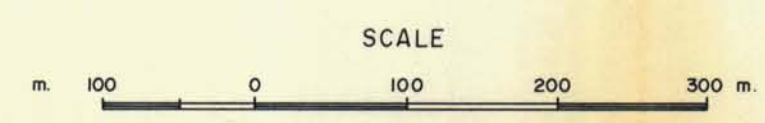
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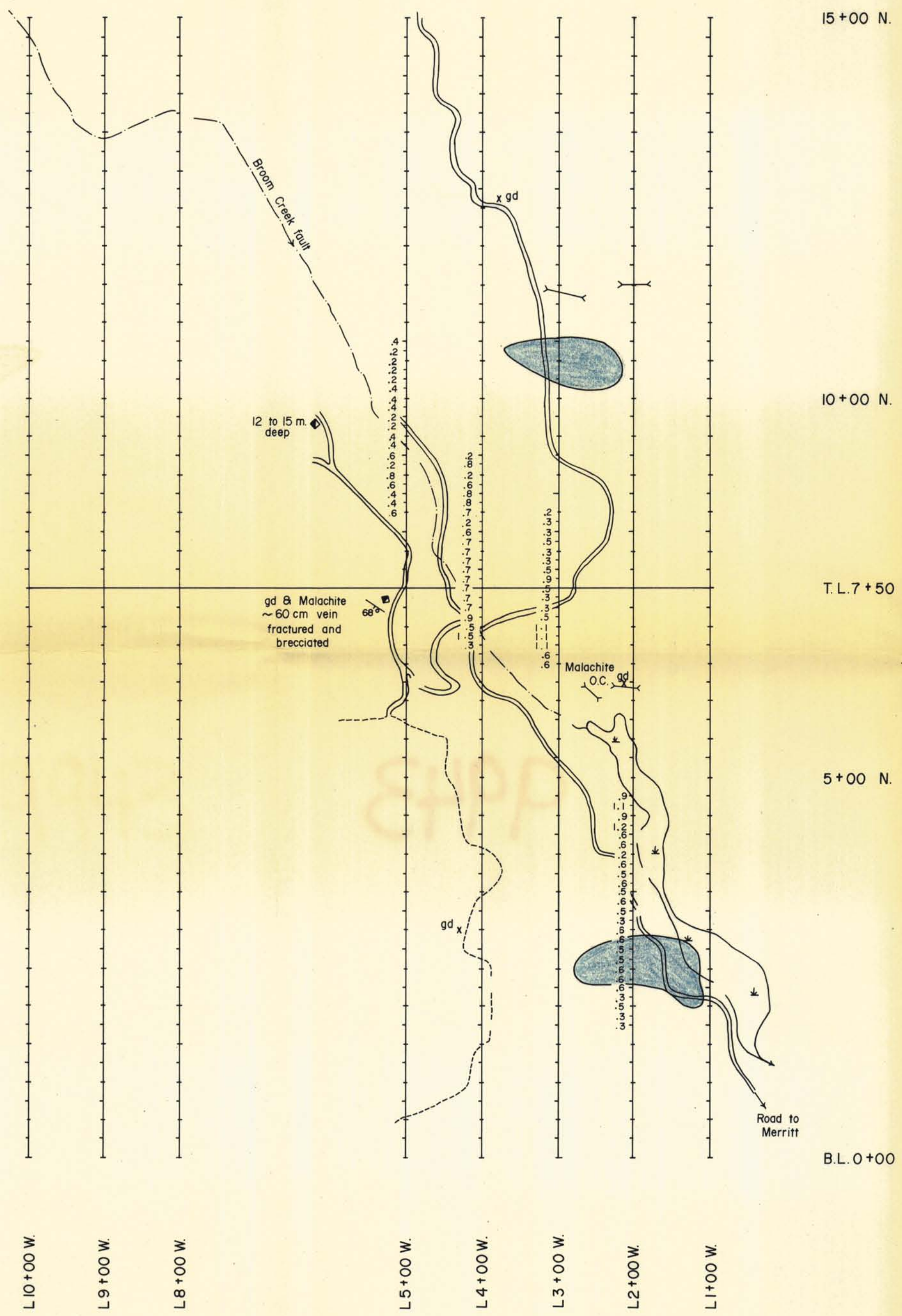
LEGEND

- SHAFT
- TRENCH
- x OUTCROP AREA
- 68° STRIKE & DIP
- DDH DIAMOND DRILL HOLE
- gd GRANODIORITE
- ROAD
- - - SKIDDER TRAIL
- ~ STREAM
- ⋆ SWAMP
- 125 COPPER VALUES, IN PPM.
- COPPER ANOMALIES DEFINED FROM PREVIOUS SURVEY (> 299 PPM)

To accompany geophysical report by J.M. Anderson, Geophysicist.

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<u>CAPER CLAIM</u>			
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COPPER VALUES			
JOB NO.:	DATE:	SCALE:	SHEET NO.:
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MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
9943
No.

LEGEND

- SHAFT
- TRENCH
- x OUTCROP AREA
- 68° STRIKE & DIP
- ddh DIAMOND DRILL HOLE
- gd GRANODIORITE
- ROAD
- - - SKIDDER TRAIL
- ~ STREAM
- ⋆ SWAMP
- .e SILVER VALUES, IN PPM.
- SILVER ANOMALIES DEFINED FROM PREVIOUS SURVEY

To accompany geophysical report by J.M. Anderson, Geophysicist.

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