

7/86

GEOPHYSICAL REPORT
ON A
VLF-EM SURVEY
OVER A PORTION OF THE
DOG CLAIM GROUP
CANNELL CREEK
KAMLOOPS MINING DIVISION
BRITISH COLUMBIA

PROPERTY : 28 km N35°W of Kamloops, B.C. on Cannell Creek
 : 50° 52' North Latitude
 : 120° 34' West Longitude
 : N.T.S. 92I/15E

WRITTEN FOR : TRANS-ARCTIC EXPLORATIONS LTD.
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GEOTRONICS SURVEYS LTD.
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 VANCOUVER, CANADA

13897

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SUMMARY

A VLF-EM survey was carried out over the Dog 2 and Dog 3 claims during the summer of 1985. The property is located 28 km N35°W of Kamloops, British Columbia on Cannell Creek. Access to the property is easily gained by a four-wheel drive vehicle. The terrain consists of gentle to steep slopes covered with light to moderately dense coniferous trees. The purpose of the survey was to map geological structure which could be related to gold-sulphide mineralization as is found on the adjacent Allies showing.

The old Allies showings were previously explored for gold. The mineralization consists of pyrite, chalcopyrite, bornite, and galena within quartz veins. These veins are within dark grey porphyry dykes cutting serpentinite of the Cache Creek group. Overlying the Cache Creek rocks on and around the Dog claims are Tertiary volcanics of the Kamloops Group.

Previous work on the Allies showing consisted of trenches, adits, and shafts dug during the 20's and 30's and, more recently, magnetic and VLF-EM surveys, soil geochemistry sampling, and limited geological mapping. Recently, the Dog claims were surveyed by airborne magnetic and VLF-EM surveys.

The VLF-EM readings were taken every 50 m on 50-meter separated east-west lines. The data were then reduced by Fraser-filtering in both north-south and east-west directions, plotted and contoured.

CONCLUSIONS

The VLF-EM survey has revealed interesting, rather complex conductors that are indicative of cross-structure and thus are of exploration interest. Anomalies a, b, and c are considered to be of particular interest.

The VLF-EM survey, however, is very preliminary and further work must therefore be done to help determine the economic potential of the property as well as the causative sources of the VLF-EM anomalies.

RECOMMENDATIONS

- 1) The property should be soil sampled on a 50 meter by a 100 meter grid. In the laboratory, the whole soil sample should be pulverized, screened for metalics and then fire-assayed with an AA finish for gold. It would also be useful to test for lead, zinc, silver, and copper. Any anomalies discovered should then be detailed on a 10 meter by 10 meter grid and the same lab procedure followed.
- 2) The VLF-EM survey should be extended over the whole property.
- 3) Geological mapping and prospecting should be thoroughly carried out over the whole property.
- 4) As an aid to the geological mapping, a magnetometer survey should be carried out with stations every 25 m on the same soil sample lines. Magnetics should be able to map intrusives as well as geological structure.
- 5) Soil anomalies should be tested by resistivity-IP sections to optimize the locations and angles of diamond drill holes.

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DOG CLAIM GROUP

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KAMLOOPS MINING DIVISION

BRITISH COLUMBIA

INTRODUCTION AND GENERAL REMARKS

This report discusses the survey procedure, compilation of data and the interpretation of a VLF-EM survey carried out over a portion of the Dog 2 and 3 Claims during the period of July 15th to July 19th, 1985.

The survey was carried out by Trans-Arctic Explorations Ltd. under the field supervision of Guy Royer, geologist, with the aid of D. Dodd. A total of 21 line km of VLF-EM survey was done.

The primary purpose of the VLF-EM survey was to delineate geological structure such as fault and shear zones that could be related to auriferous quartz veins containing sulphides and/or porphyritic dykes as occurs on the nearby Allies showing.

PROPERTY AND OWNERSHIP

The property grouped as the Dog Claim Group, consists of two 20 unit claims totalling 40 units as shown on Map 2 and as described below:

<u>Claim Name</u>	<u>No. Units</u>	<u>Record No.</u>	<u>Expiry Date</u>
Dog 2	20	4118	July 19, 1986
Dog 3	20	4119	July 19, 1986

The expiry date shown takes into account the surveys under discussion as being accepted for assessment credits.

The property is owned by Trans-Arctic Explorations Ltd. of Vancouver, British Columbia though it is registered by the mining recorder in the name of E.A. Dodd.

LOCATION AND ACCESS

The property is found 28 km N35°W of the City of Kamloops, B.C. on Cannell Creek located within the Tranquille Plateau.

The geographical coordinates are 50° 52' north latitude and 120° 34' west longitude.

Access to the property is by the Pass Lake dirt road to Pass Lake. This road starts approximately one mile north of the city centre of North Kamloops along the west side of the North Thompson River. From the agricultural research station at Pass Lake, one travels northwesterly for 1 km where one turns west and travels a further 8.5 km northwest to the Allies showing over a logging road.

Pass Lake is accessible by a two-wheel drive vehicle all year around, the road being kept open in winter. A four-wheel drive vehicle is recommended from Pass Lake to the property during summer months and a skidoo during winter months.

PHYSIOGRAPHY

The property lies at the southern end of the Tranquille Plateau which forms part of the physiographic division known as the Thompson Plateau System. The terrain varies from gentle and moderate slopes throughout most of the property to steeper slopes occurring along gullies and creeks.

Elevations vary from 1,020 meters a.s.l. on Cannell Creek at the southern property boundary to 1,530 meters a.s.l. within the northwest corner of the Dog 2 claim.

The main water sources would be Cannell Creek and its tributaries which cross the property.

The forest cover consists of fir, pine and spruce and varies from closely growing, immature stands to widely spaced, mature stands.

HISTORY OF PREVIOUS WORK

This adjacent property was previously known as the Allies Group upon which work was done in exploration for gold during the 1920's and 1930's. At this time several trenches, shafts and adits were dug out.

The property was staked as the Dog Claims in 1969-70 and in 1973, magnetic, VLF-EM, limited soil sampling and limited geological

surveys were carried out. In 1976, further soil sampling was carried out producing gold-copper anomalies that were subsequently diamond drilled. No mineralization was encountered.

Part of the above-described work has been carried out over the Dog 2 and 3 claims. In addition, airborne magnetic and VLF-EM surveys were carried out over the two claims in 1983. The results are in a report by the writer dated October 20th, 1983.

GEOLOGY

The geological description of the Allies property is taken from Cockfield and Saleken. (See Selected Bibliography.)

Much of the general area is underlain by Tertiary volcanics of the Kamloops Group. These consist of rhyolites, andesites and basalts with associated tuffs, breccias and agglomerates.

Forming a window in the Tertiary volcanics and underlying part of the Dog claims are rocks of the Carboniferous Cache Creek group. This group in this area consists of argillite, quartzite, hornstone, limestone, sheared conglomerate, breccia, greenstone, and serpentine. The units have a northwest trend with varied dips.

Cutting the Cache Creek rocks but not the Kamloops volcanics are light grey and dark grey porphyry dykes (or flows?). The dark grey porphyry is a dense rock with phenocrysts of hornblende and feldspar.

The mineralization of the Allies prospect occurs as pyrite, chalcopyrite, bornite and galena within quartz veins which occur within the dark grey porphyry dykes (or flows?). Up to 1.42 oz/ton of gold has been assayed with the sulphides.

INSTRUMENTATION AND THEORY

A VLF-EM receiver, Model 27, manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. was used for the VLF-EM survey. This instrument is designed to measure the electromagnetic component of the very low frequency field (VLF-EM), which for this survey is transmitted at 24.8 KHz from Seattle, Washington.

In all electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by a strong alternating current usually through a coil of wire. If a conductive mass such as a sulphide body is within this magnetic field, a secondary alternating current is induced within it which in turn induces a secondary magnetic field that distorts the primary magnetic field. It is this distortion that the EM receiver measures. The VLF-EM uses a frequency range from 16 to 24 KHz, whereas most EM instruments use frequencies ranging from a few hundred to a few thousand Hz. Because of its relatively high frequency, the VLF-EM can pick up bodies of a much lower conductivity and therefore is more susceptible to clay beds, electrolyte-filling fault or shear zones and porous horizons, graphite, carbonaceous sediments, lithological contacts as well as sulphide bodies of too low a conductivity for other EM methods to pick up. Consequently the VLF-EM has additional uses in mapping structure and in picking up sulphide bodies of too low a conductivity for conventional EM methods and too small for induced polarization. (In places it can be used instead of I.P.). However, its susceptibility to lower conductive bodies results in a number of anomalies, many of them difficult to explain and, thus, VLF-EM preferably should not be interpreted without a good geological knowledge of the property and/or other geophysical and geochemical surveys.

SURVEY PROCEDURE

The survey consisted of 21 line km of VLF-EM survey of the property as shown on Maps 3 to 5.

The base line, on a bearing of due north, was extended for 950 m being well flagged with survey flagging. The survey lines were run perpendicular to the base line (east-west) at a 50 m spacing. The instrument readings were taken every 50 m along the survey lines facing towards the transmitter at Seattle.

For a VLF-EM survey, the readings are quite far apart which usually results in more regional geological structures being mapped. Narrow structures, unless they are highly conductive, can be missed with widely-spaced readings.

COMPILATION OF DATA

The VLF-EM field results were plotted on Map 3 at a scale of 1:5,000. They were then reduced by applying the Fraser-filter in both an east-west direction and a north-south direction. The filtered results were subsequently plotted on Maps 4 and 5, respectively, at the same scale. The filtered data were plotted between actual reading stations. The positive dip-angle readings were then contoured at an interval of 4°.

The survey was designed for picking up northerly-trending conductors which means the data is filtered in an east-west direction. However, since the readings were taken on a square grid, 50 m by 50 m, it was decided to filter in a north-south direction as well. This is less than ideal since the transmitter direction is only 25° from due south. It was felt, however, that extra information could be gained for little cost.

The Fraser-filter is essentially a 4-point difference operator, which transforms zero crossings into peaks, and a low pass smoothing operator which induces the inherent high frequency noise in the data. Therefore, the noisy, non-contourable data are transformed into less noisy, contourable data. Another advantage of this filter is that a conductor that does not show up as a crossover on the unfiltered data quite often shows up on the filtered data.

DISCUSSION OF RESULTS

The major cause of the VLF-EM anomalies, as a rule, are geologic structures such as fault, shear and breccia zones. It is therefore logical to interpret VLF-EM anomalies to likely be caused by these structural zones. Of course, sulphides may also be a causative source. But when VLF-EM anomalies correlate with sulphide mineralization, the anomalies are often reflecting the structure associated with the mineralization rather than the mineralization itself.

There is some variation in intensity from one VLF-EM anomaly to the next. This is not only due to the conductivity of a causative source, but also the direction it strikes relative to the direction to the transmitter. In other words, those conductors lying closer to the same direction as the direction to the transmitter (S25W in this case), can be picked up easier than those that are lying at a greater angle. Depending upon its conductivity, a conductor may not be picked up at all if it is at too great an angle.

VLF-EM highs are of particular economic interest since they may be reflecting sulphides, fracturing and/or alteration any of which could be associated with gold mineralization. The highs of-

ten are at points of intersection of two or three conductors striking in two or three different directions. If the conductors are in fact geological structures, then the points of intersection become amenable to mineralizing fluids.

On both the west-east Fraser-filtered data as well as the north-south Fraser-filtered data, the writer has attempted to draw in the conductors that the contouring is trying to outline. The results are plotted on Map 3 with the emphasis placed on the results from the east-west filtering. A word of caution is that the results may not be strictly correct since the contouring is quite complex. It was not always obvious where the conductor was situated or which direction it trended.

Nevertheless, the results of the Fraser-filtering as seen on Maps 4 and 5 are very interesting. The anomalies have been labelled by the lower case letters, a to e.

Anomaly a, which is best described by the east-west filtering on Map 4 trends northerly across the survey area. It has a minimum length of 800 m and is open at both north and south ends. The anomaly is fairly strong and is somewhat complex indicating cross-structure. It is therefore of exploration interest because of the possibility of mineralization occurring along the zone.

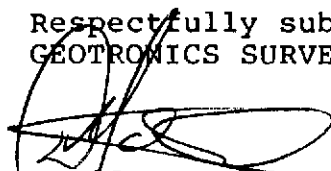
Anomaly b, is also northerly-trending, is at least 300 m long, and is open to the south. Like anomaly a, this anomaly is fairly strong.

Anomalies c, d, and e are also of exploration interest because of their complexity indicating cross-structure. All three anomalies are open in at least one direction.

Little else can be said at this point since further work will

need to be done to help determine the causative sources. As indicated above, VLF-EM anomalies can be caused by a variety of conductors.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.



David G. Mark,
Geophysicist

October 2, 1985

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GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, 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 located at #403-750 West Pender Street, Vancouver, British Columbia.

I further certify:

1. I am a graduate of the University of British Columbia (1968) and hold a B.Sc. degree in Geophysics.
2. I have been practising my profession for the past 17 years and have been active in the mining industry for the past 20 years.
3. I am an active member of the Society of Exploration Geophysicists and a member of the European Association for Exploration Geophysicists.
4. This report is compiled from data obtained from a VLF-EM survey carried out by Trans-Arctic Explorations Ltd., under the field supervision of geologist, Guy Royer, from July 15th to July 19th, 1985.
5. I do not hold any interest in Trans-Arctic Explorations Ltd. nor in the Dog 2 and 3 claims, nor will I receive any interest as a result of writing this report.


David G. Mark
Geophysicist

October 2nd, 1985

AFFIDAVIT OF EXPENSES

The VLF-EM survey was carried out from July 15th to July 19th, 1985 on the Dog 2 and Dog 3 mineral claims, on Cannell Creek, Kamloops Mining Division, B.C. to the value of the following:

FIELD:

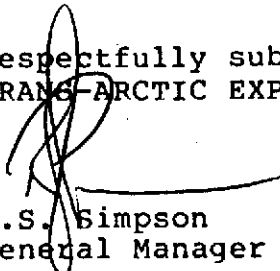
Supervisor, 2 days @ \$250/day (incl truck)	\$ 500
Geologist/Instrument operator, 45 hours @ \$25/hour	1,125
Surveyors helper, 41 hours @ \$20/hour	820
4 X 4, 3/4 ton truck, 5 days @ \$110/day (includes oil and gas)	550
Room and board, 5 days for 2 men @ \$100/day	500
Instrument rental (VLF-EM), 5 days @ \$25/day	125
Survey supplies	150
	<hr/>
	\$ 3,770

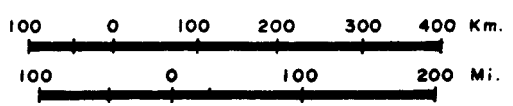
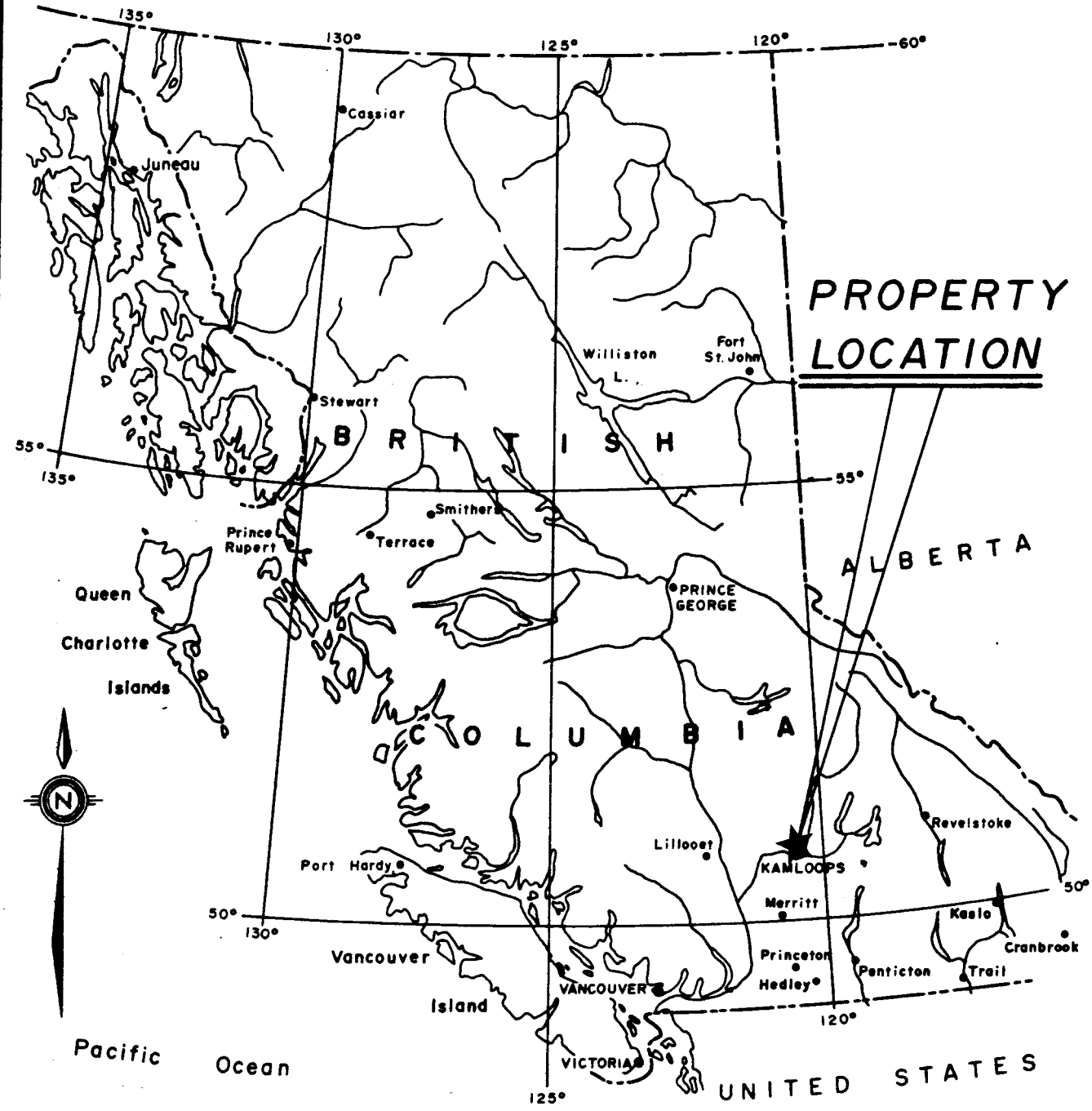
OFFICE:

Geophysicist, 10 hours @ \$45/hr	\$ 450
Geophysical technician, 15 hours @ \$25/hr	375
Drafting and printing	400
Typing and photocopying	100
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	\$ 1,325

GRAND TOTAL \$5,195

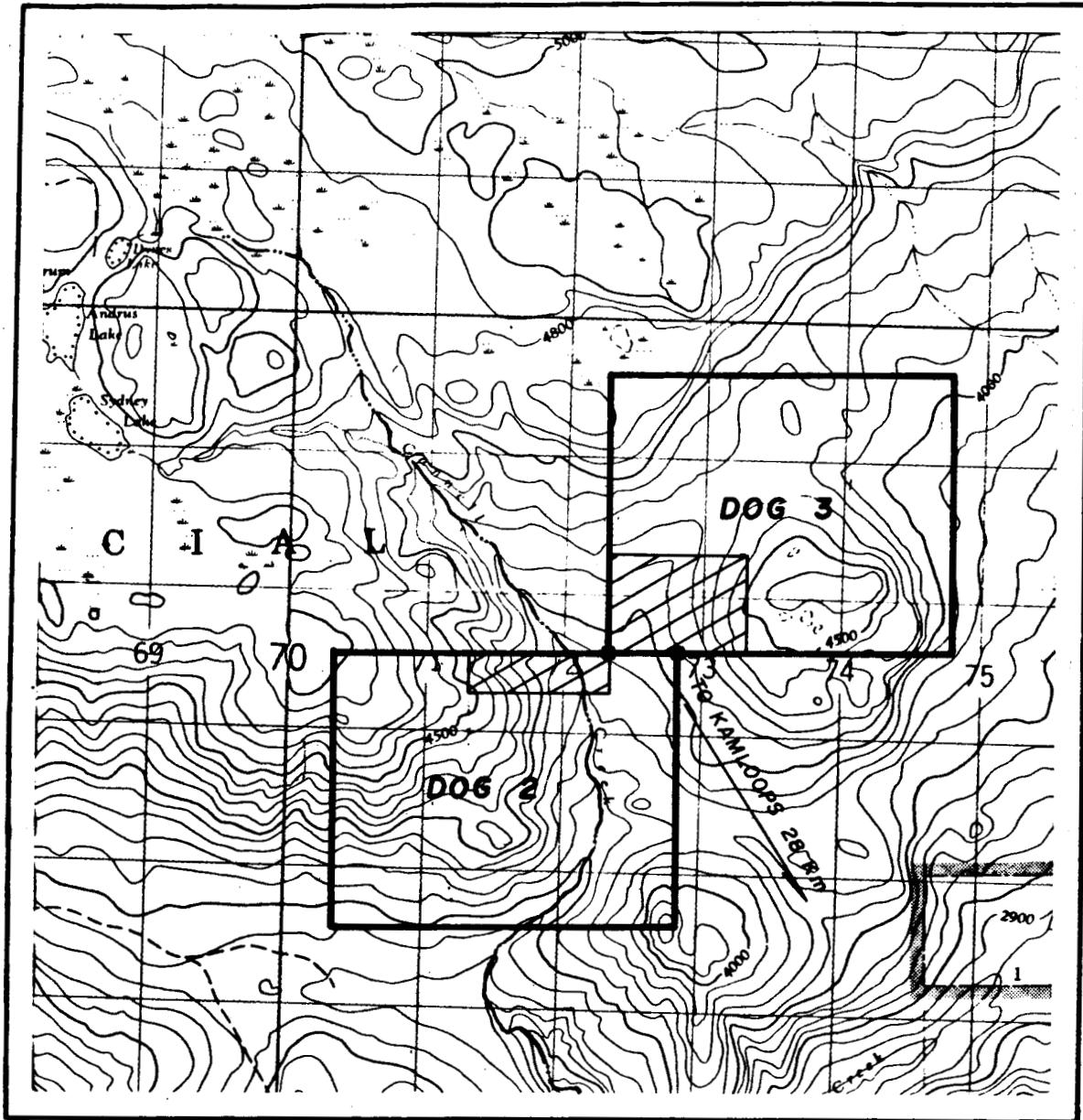
Respectfully submitted,
TRANS-ARCTIC EXPLORATIONS LTD.


R.S. Simpson
General Manager



DOG CLAIM GROUP

120° 34'



50° 53'

50° 52'

Survey Area '85



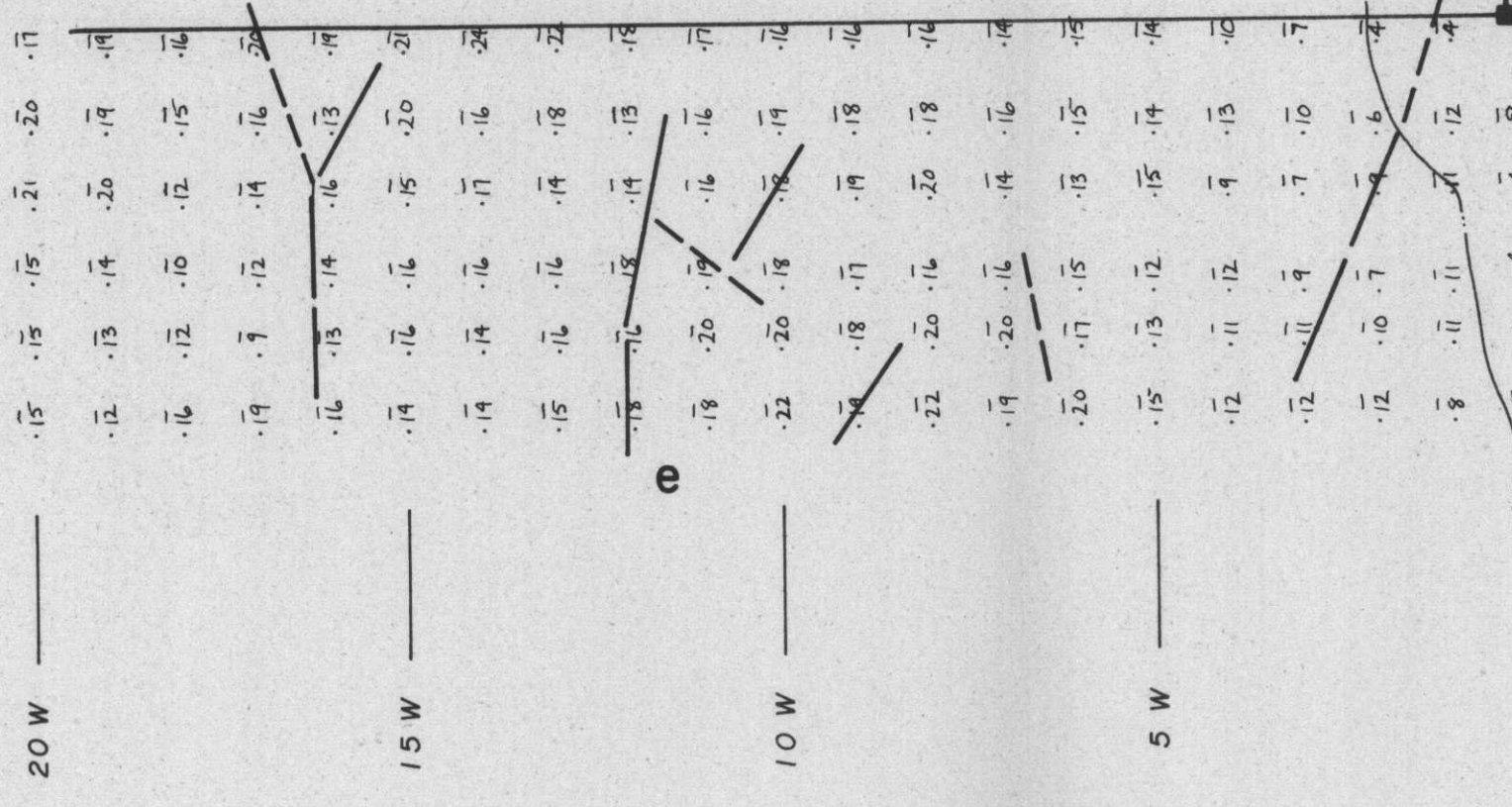
TRANS-ARCTIC EXPLORATIONS LTD.			
DOG CLAIM GROUP			
CANNELL CREEK, KAMLOOPS AREA			
KAMLOOPS M. D., B. C.			
CLAIM LOCATION MAP			
SCALE: 1: 50,000	DATE: OCT. 85.	MAP: 2	N.T.S. 921/15 E



TRANSMITTER

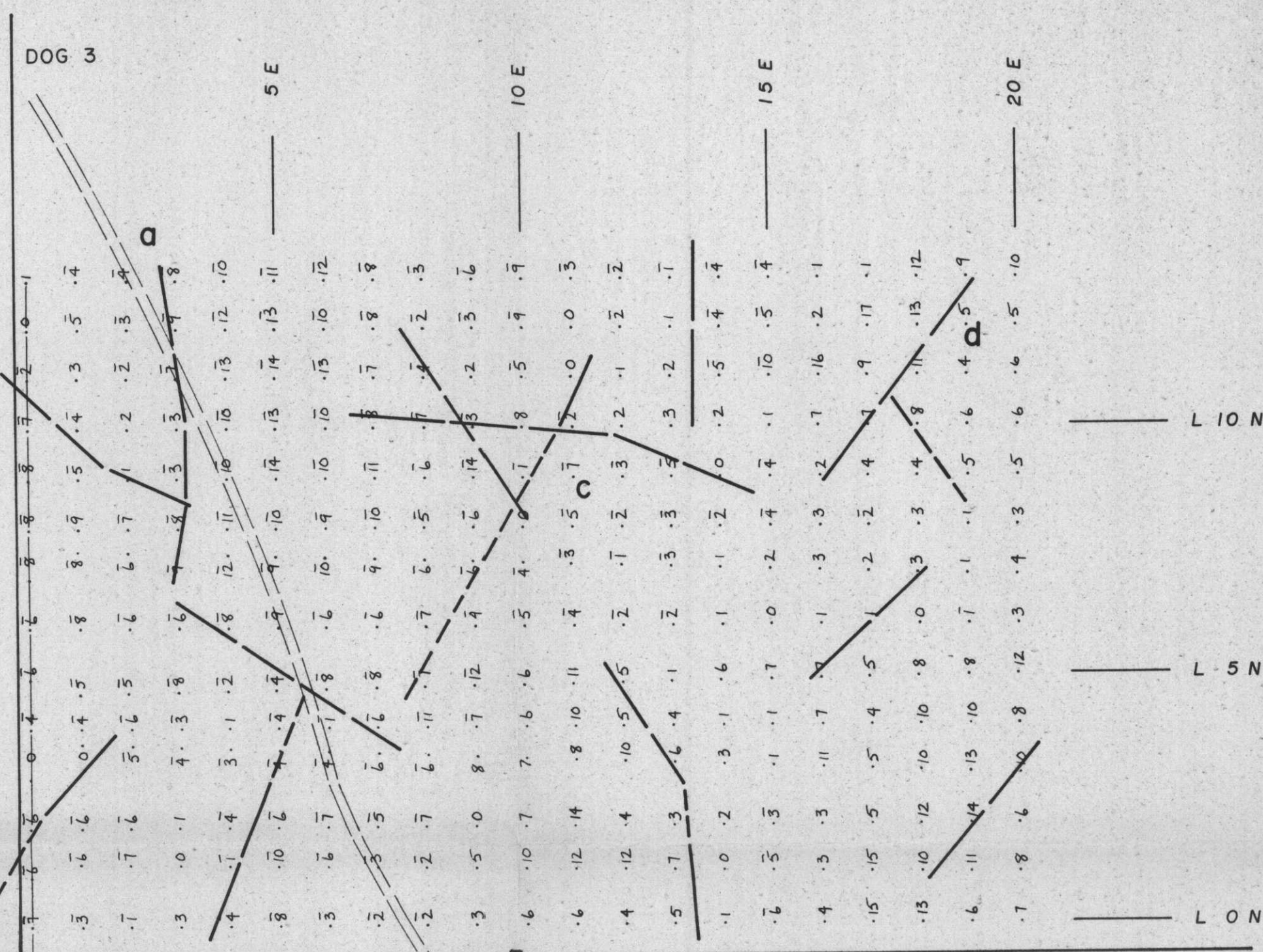


Seattle 24.8 KHz.



LEGEND

- Claim boundary
- Legal corner post
- Road
- Survey station
- Creek



28 Km to Kamloops

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

13,897

Accompany Report By: DAVID S. MARK, Geophysicist.

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DOG CLAIM GROUP
CANNELL CREEK, KAMLOOPS AREA
KAMLOOPS M. D., B. C.

VLF-EM SURVEY
RAW DATA & CONDUCTORS

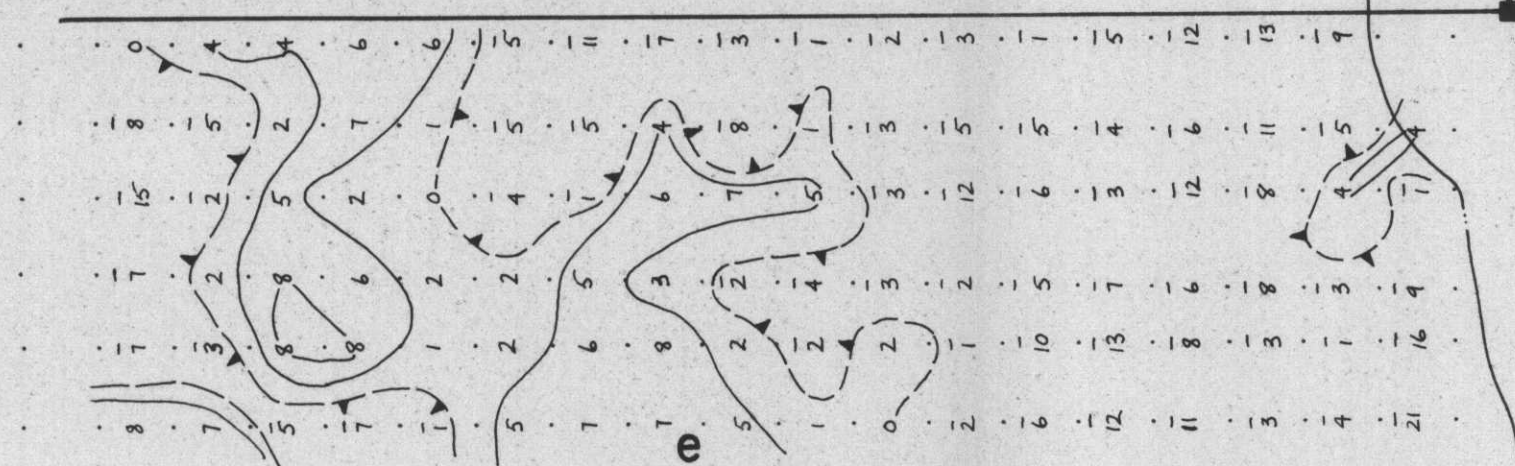
SCALE: 1:5,000	DATE: OCT. 85.	N.T.S. 92 1/15 E	MAP: 3	DRAFTED BY: B. D. S.
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TRANSMITTER



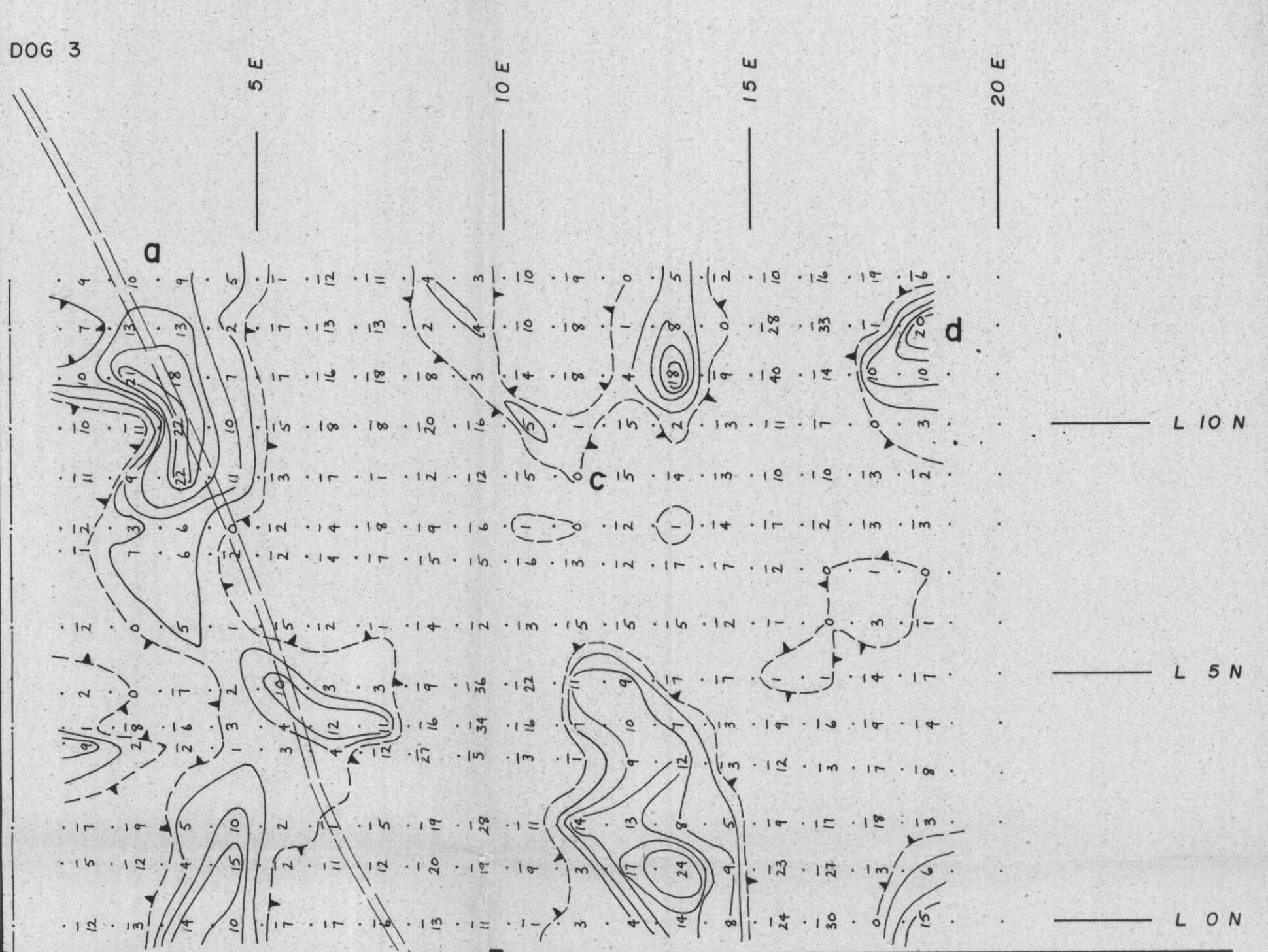
Seattle 24.8 KHz.



20 W ——— 15 W ——— 10 W ——— 5 W ———

LEGEND

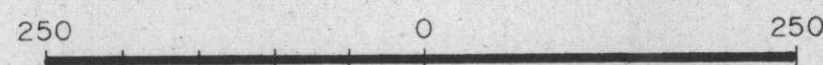
- Claim boundary
- Legal corner post
- Road
- Survey station
- Creek



28 Km to Kamloops

CONTOUR INTERVAL

- 0 degree
- 4 degrees and higher
- Depression



INSTRUMENT: Sabre Model 27 VLF-EM Unit.
**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

13,397

To Accompany Report By: DAVID G. MARK, Geophysicist.

TRANS-ARCTIC EXPLORATIONS LTD.

DOG CLAIM GROUP
CANNELL CREEK, KAMLOOPS AREA
KAMLOOPS M. D., B. C.

VLF-EM SURVEY
W-E FRASER FILTERED DATA & CONTOURS

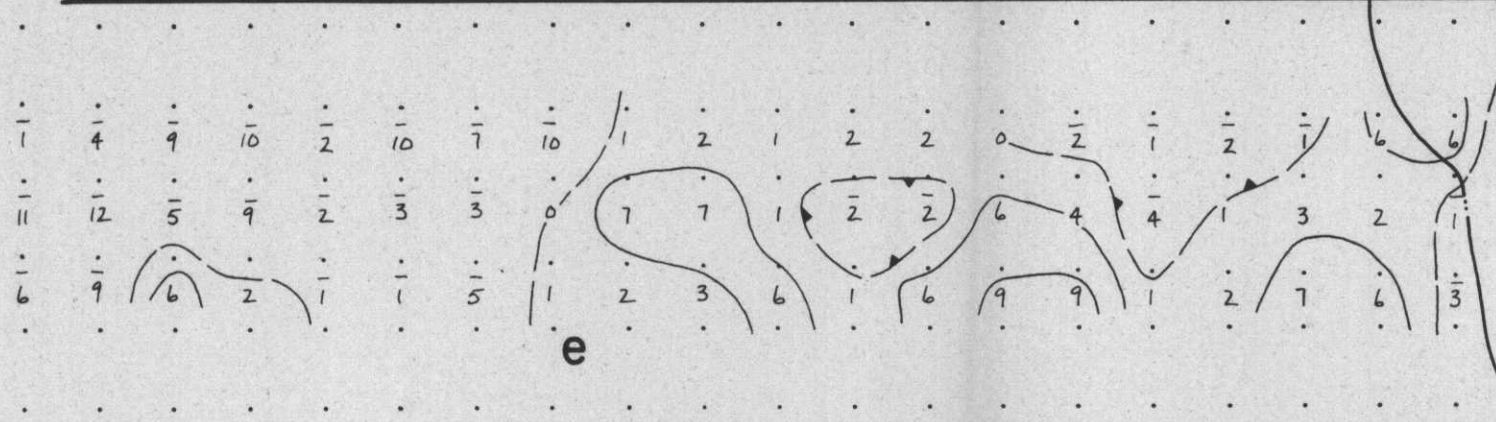
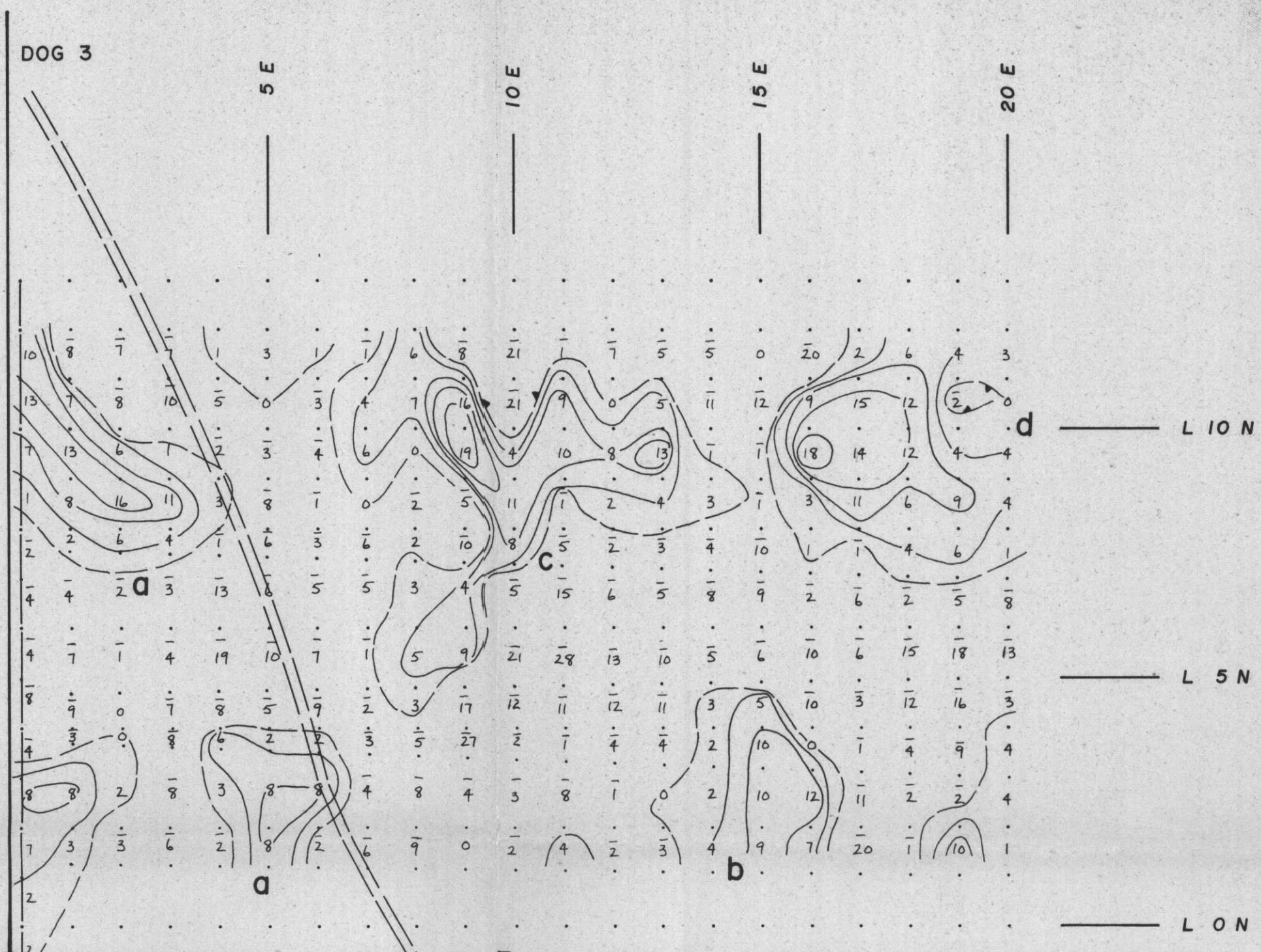
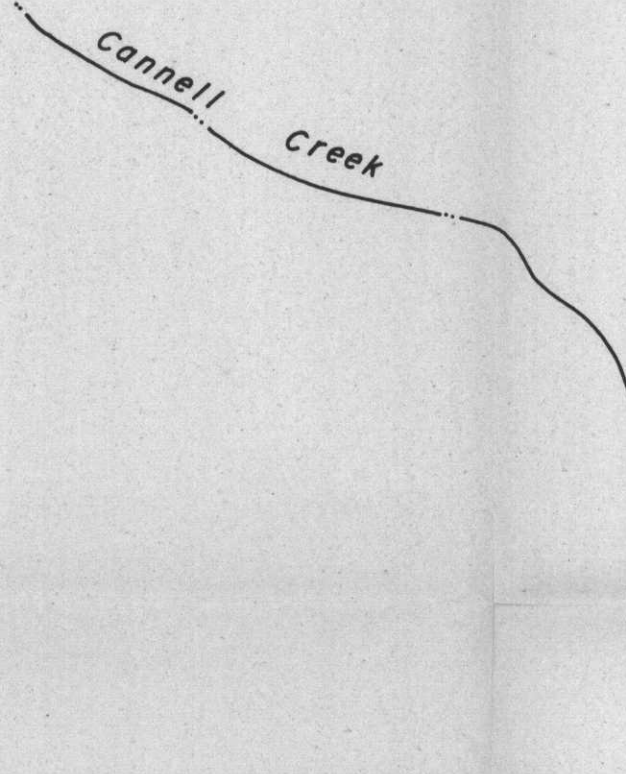
SCALE: 1:5,000	DATE: OCT. 85.	N.T.S. 92 1/15 E	MAP: 4	DRAFTED BY: B. D. S.
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TRANSMITTER



Seattle 24.8 KHz.

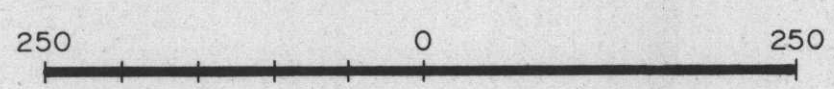


20 W | 15 W | 10 W | 5 W | Baseline

- LEGEND**
- Claim boundary
 - Road
 - Legal corner post
 - Survey station
 - Creek

CONTOUR INTERVAL

- 0 degree
- 4 degrees and higher
- Depression



28 Km to Kamloops

GEOLOGICAL BRANCH
INSTRUMENT: Scobro Mode 27 VLF EM UNIT
ASSESSMENT REPORT

13,897

To Accompany Report By: DAVID G. MARK, Geophysicist.

TRANS-ARCTIC EXPLORATIONS LTD.

DOG CLAIM GROUP
CANNELL CREEK, KAMLOOPS AREA
KAMLOOPS M. D., B. C

VLF-EM SURVEY
N-S FRASER FILTERED DATA & CONTOURS

SCALE: 1:5,000	DATE: OCT. 85.	N.T.S. 92 1/15 E	MAP: 5	DRAFTED BY: B. D. S.
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