

8/85

GEOPHYSICAL REPORT
ON A
VLF-EM SURVEY
WITH SOME GEOLOGICAL MAPPING
OVER THE
WALSH CLAIM
PERRY CREEK, CRANBROOK AREA
PORT STEELE MINING DIVISION
BRITISH COLUMBIA

PROPERTY : 22.5 km S80°W of Cranbrook, B.C.
 on Perry Creek.
 : 49° 116° SE
 : N.T.S. 82F/8E

OWNED BY : TRANS-ARCTIC EXPLORATIONS LTD.
 815-850 West Hastings Street
 Vancouver, B.C., V6C 1E2

SURVEY BY : TRANS-ARCTIC EXPLORATIONS LTD.
 815-850 West Hastings St
 Vancouver, B.C., V6C 1E2

WRITTEN BY : David G. Mark, Geophysicist
 GEOTRONICS SURVEYS LTD.
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DATED : November 23rd, 1984

12983



GEOTRONICS SURVEYS LTD.
 Engineering & Mining Geophysicists
 VANCOUVER, CANADA

84-1106-12983.

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ASSESSMENT REPORT**

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SUMMARY

A VLF-EM survey was carried out over the southern portion of the Walsh Claim during the summer of 1984. The property is located 22.5 km S80°W of Cranbrook, British Columbia on Perry Creek. Access to the property is easily gained by a two-wheel drive vehicle. The terrain consists of steep slopes covered with light to moderately dense coniferous trees as well as alpine meadow. The purpose of the survey was to map geological structure which could be related to gold-sulphide mineralization as is found on the nearby Leader A Claim.

The property occurs on the contact between the Creston Formation and the Kitchener-Siyeh Formation, the contact of which occurs along Perry Creek. Covering most of the property southeast of Perry Creek is the Creston Formation, which is composed mostly of argillites and quartzites. Northwest of Perry Creek is the Kitchener-Siyeh Formation which is composed of impure magnesium limestone, argillites, and calcareous quartzites. On the nearby Leader A Claim occurs an auriferous quartz vein returning assays up to 0.598 oz gold/ton and 10.56 oz silver/ton across 0.58 m.

The VLF-EM readings were taken every 50 meters on 100-meter separated east-west lines. The data was then reduced, plotted and contoured. Some geological mapping was done as well.

CONCLUSIONS

The geological mapping has shown the grid area to be underlain by argillites.

The VLF-EM survey has indicated northeasterly-and northwesterly-trending faults (or possibly lithological contacts). Some of the geological structures intersect indicating areas amenable to gold mineralization.

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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INTRODUCTION AND GENERAL REMARKS

This report discusses the survey procedure, compilation of data and the interpretation of a VLF-EM survey carried out over the southern portion of the Walsh Claim during the period of June 3rd to June 26th, 1984. Some geological mapping was done as well.

The surveys were carried out by Trans-Arctic Explorations Ltd. under the field supervision of Guy Royer, geologist, with the aid of Dean Bowra. A total of 8.35 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 as occurs on the nearby Leader A Claim.

PROPERTY AND OWNERSHIP

The property consists of two claims totalling 16 units staked within the Fort Steele Mining Division 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>
Walsh	12	1915	August 29, 1986
Manchester	<u>4</u>	2138	March 28, 1986
	16		

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

The claims are owned by Trans-Arctic Explorations Ltd. of Vancouver, British Columbia.

LOCATION AND ACCESS

The property is located 22.5 km west of Cranbrook on Perry Creek at its intersections with Walsh Creek and Manchester Creek.

The geographical coordinates are 49°29'N latitude and 116°05'W longitude.

Access is easily gained by travelling north from Cranbrook on Highway #95A for 15 km to Wycliffe. One then turns south and travels southwesterly along the Perry Creek access road to the northern boundary of the property, a distance of about 15 km. 1

PHYSIOGRAPHY

The property lies to the west of the Rocky Mountain trench within the Purcell Mountains which are physiographic divisions of the Columbia Mountain System. The terrain consists of steep, partially logged slopes throughout most of the property. It lies on the southeast side of the northeasterly-trending valley of Perry Creek.

Elevations vary from about 1,325 meters a.s.l. on Perry Creek on the northern boundary of the Walsh claim, to 1,810 meters a.s.l. within the southeast corner of the Walsh claim to give an elevation difference of 485 meters.

The main water sources would be Perry Creek as well as easterly-flowing and northwesterly-flowing tributaries of Perry Creek (Walsh, Manchester, Wuhun creeks).

The forest cover consists of fir, spruce and hemlock(?) and varies from closely growing, immature stands to more widely spaced, mature stands. The upper elevations are covered by alpine meadow.

HISTORY OF PREVIOUS WORK

Since the two claims have been staked, no previous work has been done.

The history of the area goes back to the 1880's when prospectors working the Perry Creek placers discovered the vein now covered by the adjoining Leader A Claim. Little ore has been shipped from this vein, even though assays have run as high as 4.8 oz/ton Au and 6.8 oz/ton Ag. There are also high values in lead, zinc and copper.

GEOLOGY OF AREA

The following is quoted from L. Sookchohoff's 1983 Geological Evaluation Report on the adjoining Leader 2 Claim:

"The general geological setting of the area is of the Proterozoic Lower Purcell Group which is divided into three Formations. In the Hellroaring Creek - Perry Creek - Perry Creek area the Creston and Kitchener Formation predominate and are lenticularly northeasterly trending, commonly in a fault contact and bounded to the north and south by the Aldridge Formation.

"The basal Aldridge Formation - the oldest formation known to occur in the area - is composed mainly of grey to brownish grey, rusty weathering argillite and argillaceous quartzite.

"The Creston Formation is transitional from the Aldridge Formation and embraces that succession of greyish argillaceous quartzites which is included between the dark rusty weathering, argillaceous quartzites of the lower Aldridge Formation and the thin bedded, calcereous rocks of the upper Kitchener Formation. In general, the Creston Formation consists of argillaceous quartzites, purer quartzites and argillites whose beds average about one foot in thickness. Narrow beds, pods, and lenses of calcereous rocks occur in the upper part of the formation. These are more numerous toward the top of the Creston and where they are abundant, the strata are considered to belong to the overlying Kitchener Formation.

"The Creston Formation is host to gold quartz veins on Perry Creek, a northeasterly flowing tributary of the St. Mary River with the confluence 13 km northwest of Cranbrook. The deposits occur in the argillaceous quartzites which are well bedded in beds '2 inches to 2 feet' in thickness, the latter separates by thin beds of meta-argillites.

"The deposits occur as true fissure veins averaging about '8 feet' with some as wide as '20 feet'. They can be traced for long distances along strike. The gold values occur as native in the outcrops and with pyrite at depth.

"The Kitchener Formation consists predominantly of impure, magnesium limestone, argillite and calcereous quartzite. Limestone and calcereous rocks compose the bulk of the formation and serve to distinguish it from the underlying formations. The upper part is generally argillaceous. Due to the formation containing easily deformed rocks, great stretches of it have been altered to chlorite and talc-carbonate schist.

"A small stock of porphyritic granite within one km west of the property intrudes sediments of the Creston Formation. The granite contains large idiomorphic crystals of orthoclase in an isometric groundmass of plagioclase, quartz and hornblende.

STRUCTURE

"The general structure of the area is of a broad, northerly striking anticline exposing the core of the Proterozoic rocks with younger rocks to the west and east. The regional St. Mary's fault trends east northeast to the north of the property area and creates a fault contact with the Aldridge and younger formations.

"Faults extending from the south generally terminate or trend into the St. Mary's fault and commonly indicate contacts between the Creston and Kitchener formations.

"One of the fault contacts referred to as the Sawmill Creek Fault determines a Creston-Kitchener Formation contact which trends through the Leader A Claim. The St. Mary's fault is within two km north.

MINERALIZATION

"On the adjacent Leader A Claim a mineralized quartz vein follows a strong fissure with varying strike from nearly north-south to north 35-50° with a dip of from 68° to 80° east. The vein varying from 'a few inches to three feet wide' can be traced along a length of '2,000 feet'. The vein is composed of white banded quartz containing galena, pyrite and locally chalcopyrite with tungsten reported in the adit at the southernmost extension of the vein.

"Assays from the Leader A vein reportedly returned up to .598 oz Au/ton and 10.56 oz Ag/ton across '1.9 feet' with a reported assay of 4.80 oz Au/ton. A reported 1720 tons of possible ore were calculated on the vein."

PROPERTY GEOLOGY

Rice's G.S.C. map shows the Walsh and Manchester claims are almost entirely underlain by the Creston Formation which trends northeasterly through the property. To the northwest and across Perry Creek the claims are underlain by the Kitchener Formation.

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 al-

ternating 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 8.35 line km of VLF-EM survey of the property as shown on Map 4.

The base line, on a bearing of due north, was extended for 1000 m being well flagged with survey flagging. The survey lines were run perpendicular to the base line (east-west) at 50 m spacings. 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.

Mr. Guy Royer mapped the geology of the outcrops as the VLF-EM survey was progressing.

COMPILATION OF DATA

The geology of the outcrops within the survey grid is plotted on map 3 at a scale of 1:5,000.

The VLF-EM field results were plotted on Map 4 at a scale of 1:5,000. They were then reduced by applying the Fraser-filter. The filtered results were subsequently plotted on Map 5, 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 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

1) Geology

East of Perry Creek, the rock outcrops as mapped are probably of the Creston Formation. The rocks have been divided into three types.

A greyish black argillite occurs on the northern part of the eastern outcrop on lines 8N and 9N. It contains intercalated quartz beds, some showing pygmatic folding.

The most predominant rock is a chloritic argillite with excellent slaty foliation and with the colour varying from light buff to light green to medium green. It contains some intercalated quartz and carbonate bedding bands that are up to 5 cm thick. The greenish-coloured and very soft bands imply the presence of talc and chlorite (particularly the latter). The buff-coloured bands imply the presence of carbonate. The outer surface of some of the bands are very rusty in colour.

The southeastern-most outcrop has been mapped as an argillaceous quartzite, medium grey in colour. It contains some iron and manganese.

West of Perry Creek, an outcrop mapped as siliceous argillite, is probably of the Kitchener Formation. The colour is light grey to dark green.

The Creston sediments strike north-northeasterly and dip 60-70°E on the eastern outcrops and 75°W on the western outcrops. The Kitchener argillite bedding strikes north-northeasterly as well and dips 40-60°W.

The only mineralization noted was sparse cubes of pyrite occurring within the argillite outcrop located on line 9N adjacent to Perry Creek.

2) VLF-EM Survey

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 parallel or sub-parallel to the direction of the transmitter (S55W 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.

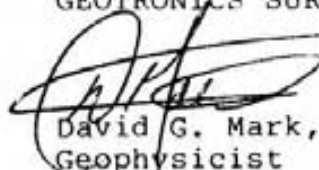
VLF-EM highs are of particular economic interest since they may be reflecting sulphides, fracturing and/or alteration any of which could be associated with gold mineralization. The highs often are at points of intersection of two or three conductors striking in two or three different directions. If the conductors are in fact geological structures, then the points of intersection become amenable to mineralizing fluids.

From the 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 4. 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 interesting. They indicate, assuming that the conductors are reflecting geological structure, that the two main directions of geological structure, strike northwesterly and northeasterly. These are probably faults, especially considering that some of the conductors occur between the northerly-trending outcrops of argillites. Some of the conductors cross each other, making these areas prime zones for further exploration of economic mineralization.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.



David G. Mark,
Geophysicist

November 23rd, 1984

SELECTED BIBLIOGRAPHY

Chamberlain, V.R. Geological Report, Ursus Prospect, Marysville District, Assessment Report No. 661, Sept. 1963.

Leech, G.B., Geology Map - St. Mary Lake, British Columbia, Sheet 82 F/9, G.S.C. Map 15-1957, 1957.

Rice, H.M.A. - Nelson Map-Area, East Half, British Columbia, G.S.C. Memoir 228, 1966.

Schofield, S.J. Geology of Cranbrook Area, British Columbia, 1915.

Sookochoff, L. Geological Evaluation Report for Hawk Resources Inc. on the Leader 2 Mineral Claim, August 17, 1983.

Minister of Mines Reports

1915 - p. 113

1932 - p. 162

1950 - p. 155


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 16 years and have been active in the mining industry for the past 19 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 and geological mapping carried out by Trans-Arctic Explorations Ltd., under the field supervision of geologist, Guy Royer, from June 3rd to June 29th, 1984.
5. I do not hold any interest in Trans-Arctic Explorations Ltd. nor in the Walsh and Manchester claims, nor will I receive any interest as a result of writing this report.


David G. Mark
Geophysicist

November 23rd, 1984

AFFIDAVIT OF EXPENSES

The VLF-EM and geological surveys were carried out from June 3rd to June 29th, 1984 on the Walsh mineral claim, in the Cranbrook Area, Fort Steele Mining Division, B.C. to the value of the following:

FIELD:

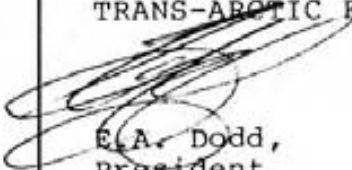
Supervisor, 1 day @ \$200/day	\$ 200
Geologist/Instrument operator, 3 days @ \$200/day	600
Surveyor's helper, 3 days @ \$125/day	375
4 X 4, 3/4 ton truck, 3 days @ \$110/day (includes oil and gas)	330
Room and board, 2 men for 3 days @ \$100/day	300
Instrument rental (VLF-EM), 3 days @ \$25/day	75
Survey supplies	<u>150</u>
	\$2,230

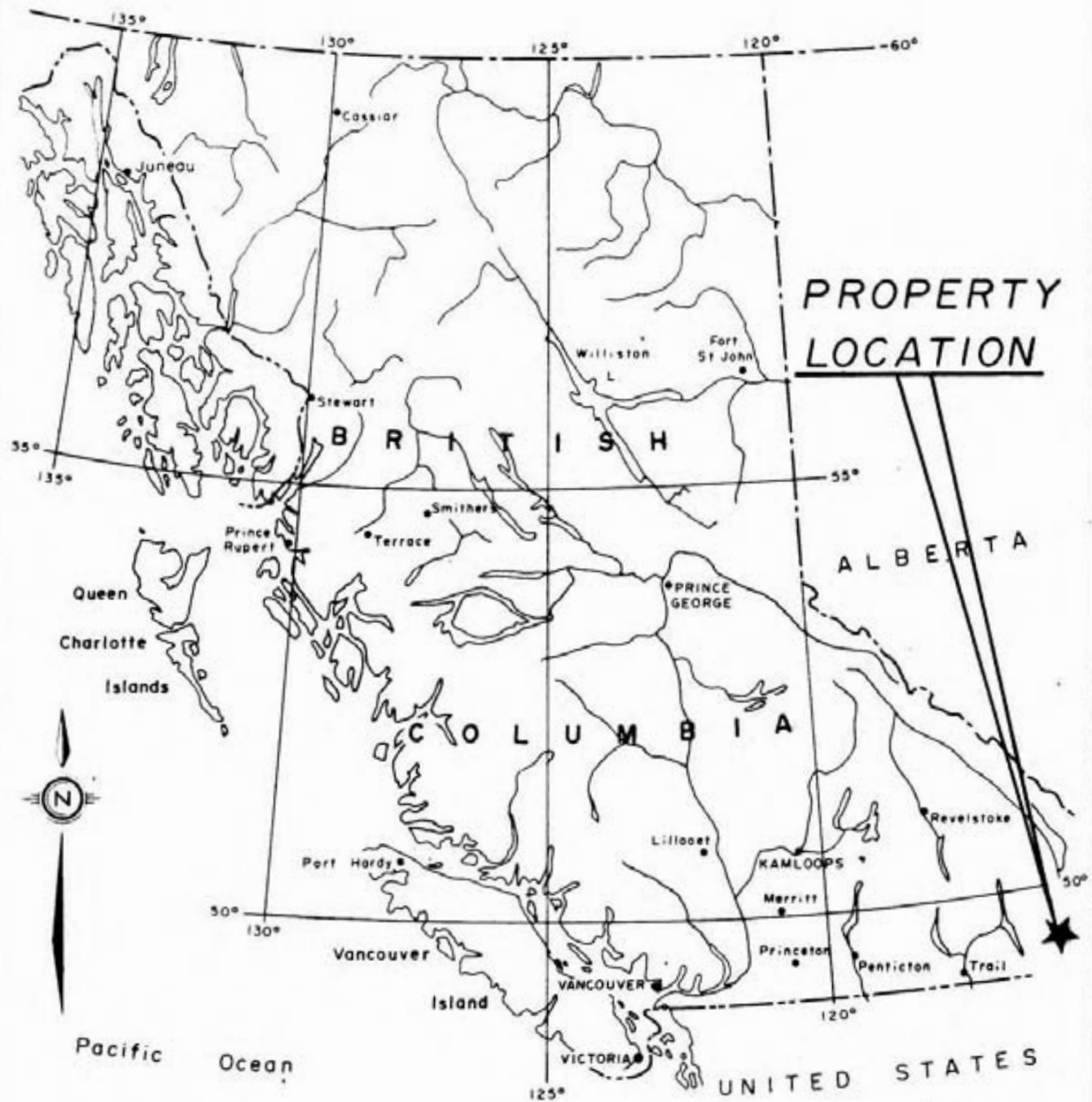
OFFICE:

Geophysicist, 10 hours @ \$40/hr	\$ 400
Geophysical technician, 15 hours @ \$25/hr	375
Drafting and printing	300
Typing, compilation and photocopying	100
	<u>100</u>
	\$1,175

GRAND TOTAL	<u>\$3,405</u>
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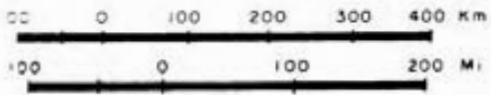
Respectfully submitted,
TRANS-ARCTIC EXPLORATIONS LTD.


E.A. Dodd,
President



**PROPERTY
LOCATION**

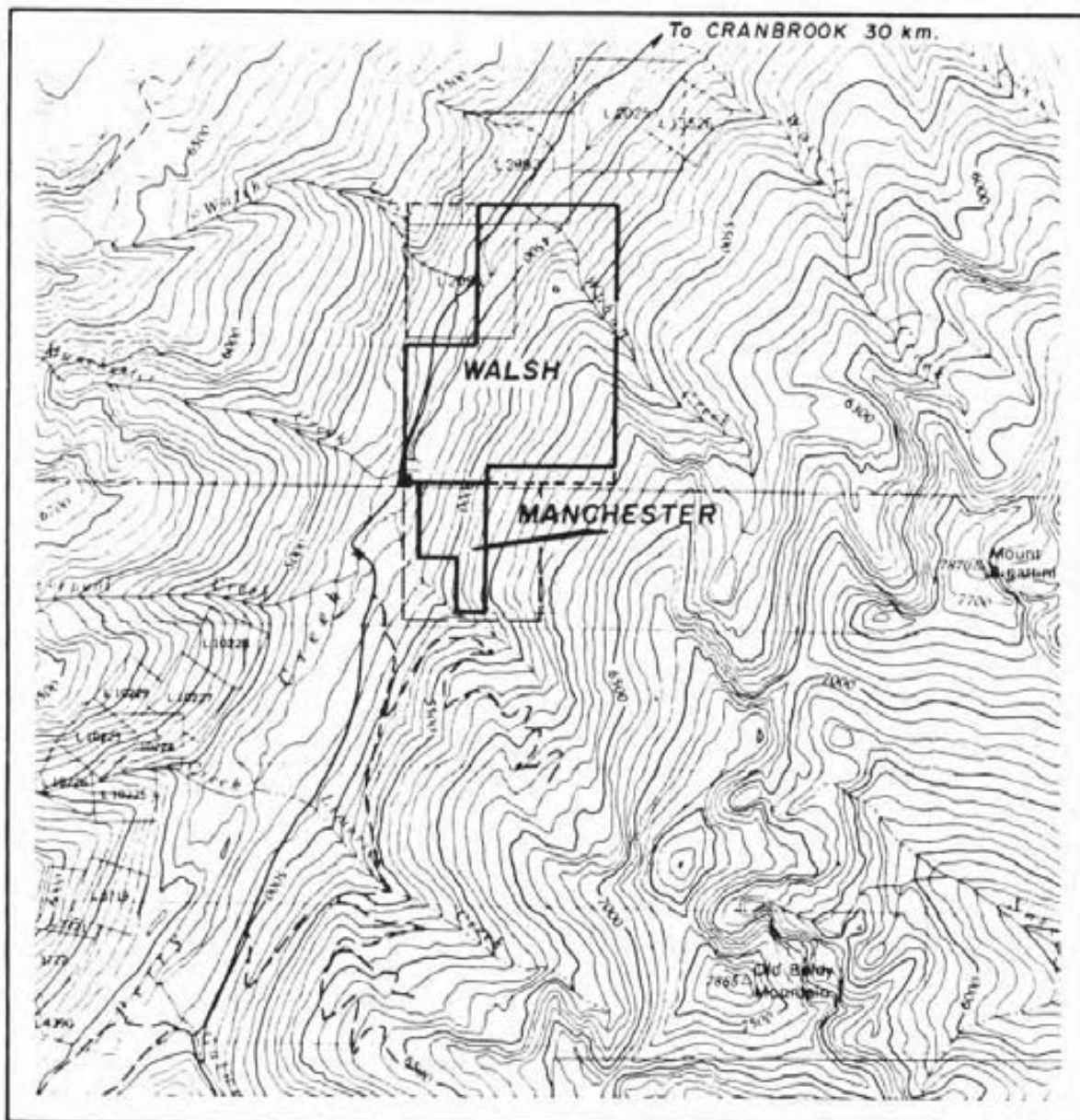
WALSH & MANCHESTER CLAIMS



116°05'

To CRANBROOK 30 km.

49° 29'



TRANS-ARCTIC EXPL. LTD.

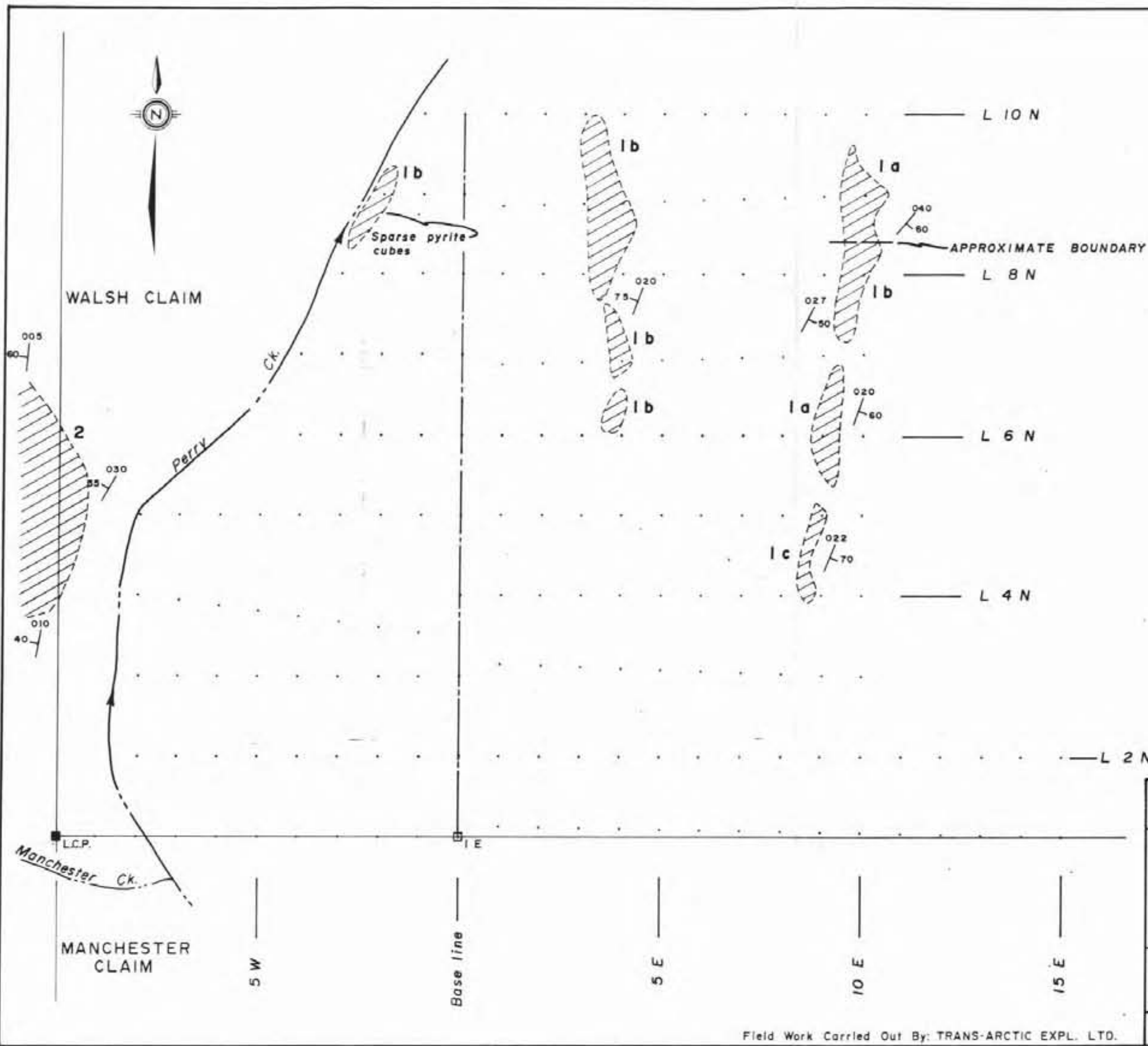
WALSH & MANCHESTER CLAIMS

PERRY CREEK, CRANBROOK AREA, B.C.

FORT STEELE M. D.

CLAIM LOCATION MAP

SCALE:	DATE:	MAP:	NTS:
1:50,000	Nov. 84.	2	82 F/8 E



LEGEND

- Survey station
- Claim boundary

LITHOLOGY

- ⊥ Strike and dip
- ▨ Outcrop

CRESTON FORMATION ?

- 1a** argillite, greyish black.
- 1b** chloritic, slaty argillite with some quartz and carbonate bedding. (up to 5 cm thick), light buff to light green to medium green.
- 1c** argillaceous quartzite, medium grey.

KITCHENER FORMATION ?

- 2** siliceous argillite, light grey to green.

GEOLOGY MAP BY GUY ROYER, Geologist
E. DODD, Assistant

N.T.S. 82 F/8 E



To Accompany Report By: DAVID G. MARK, Geophysicist

TRANS-ARCTIC EXPL. LTD.

WALSH & MANCHESTER CLAIMS
PERRY CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

GEOLOGY MAP

SCALE: 1:5,000	DATE: Nov. 84.	MAP: 3	DRAWN BY: B. D. S.
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WALSH CLAIM

LUKE CLAIM

MANCHESTER CLAIM

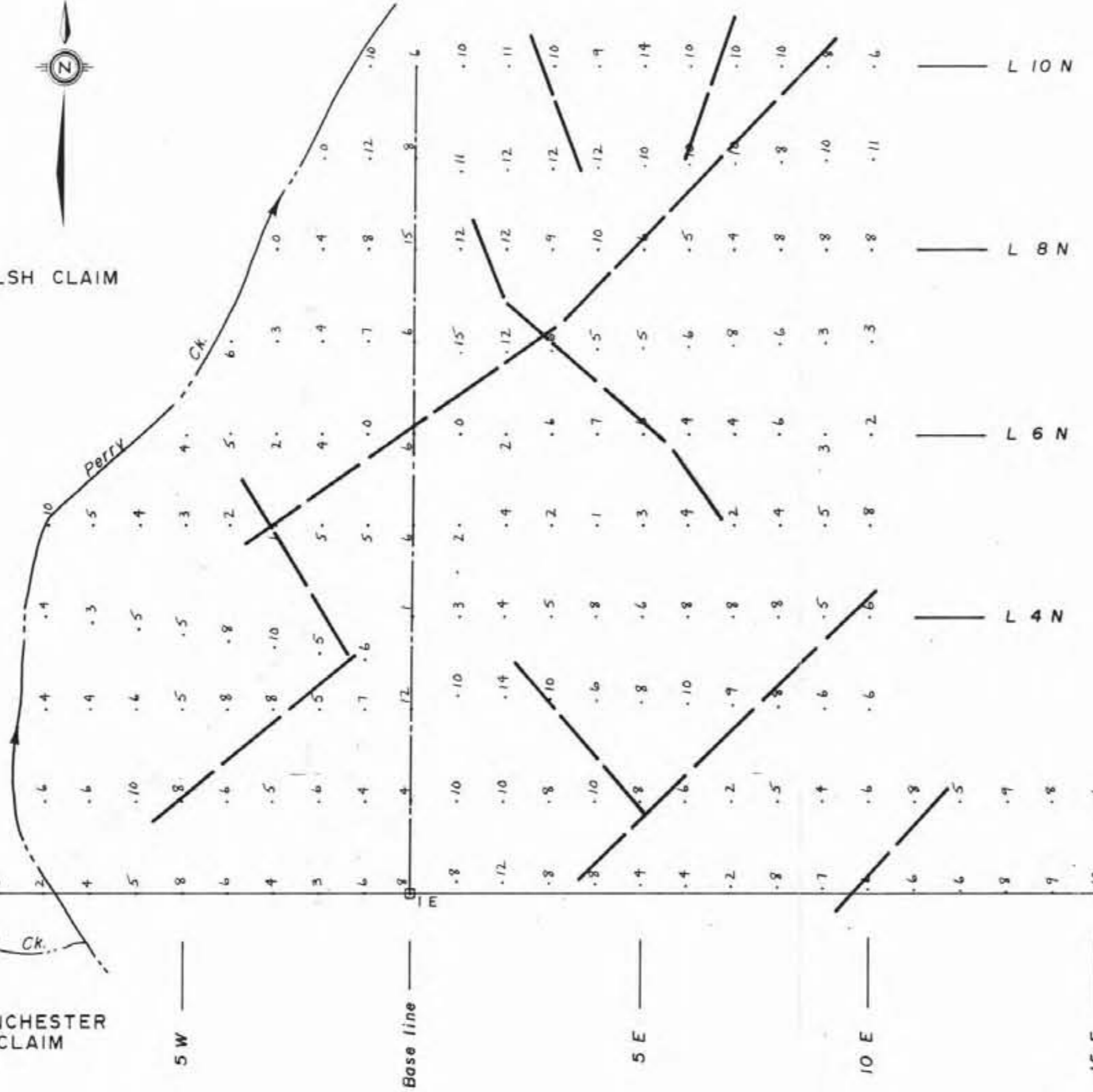
5 W

Base line

5 E

10 E

15 E



LEGEND

- Survey station
- Creek direction
- Claim boundary
- Axis of VLF-EM conductor

Positive values to North of survey station
 Negative values to South of survey station

SEATTLE TRANSMITTER
 24.8 KHZ.

N.T.S. 82 F/8 E



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WALSH & MANCHESTER CLAIMS

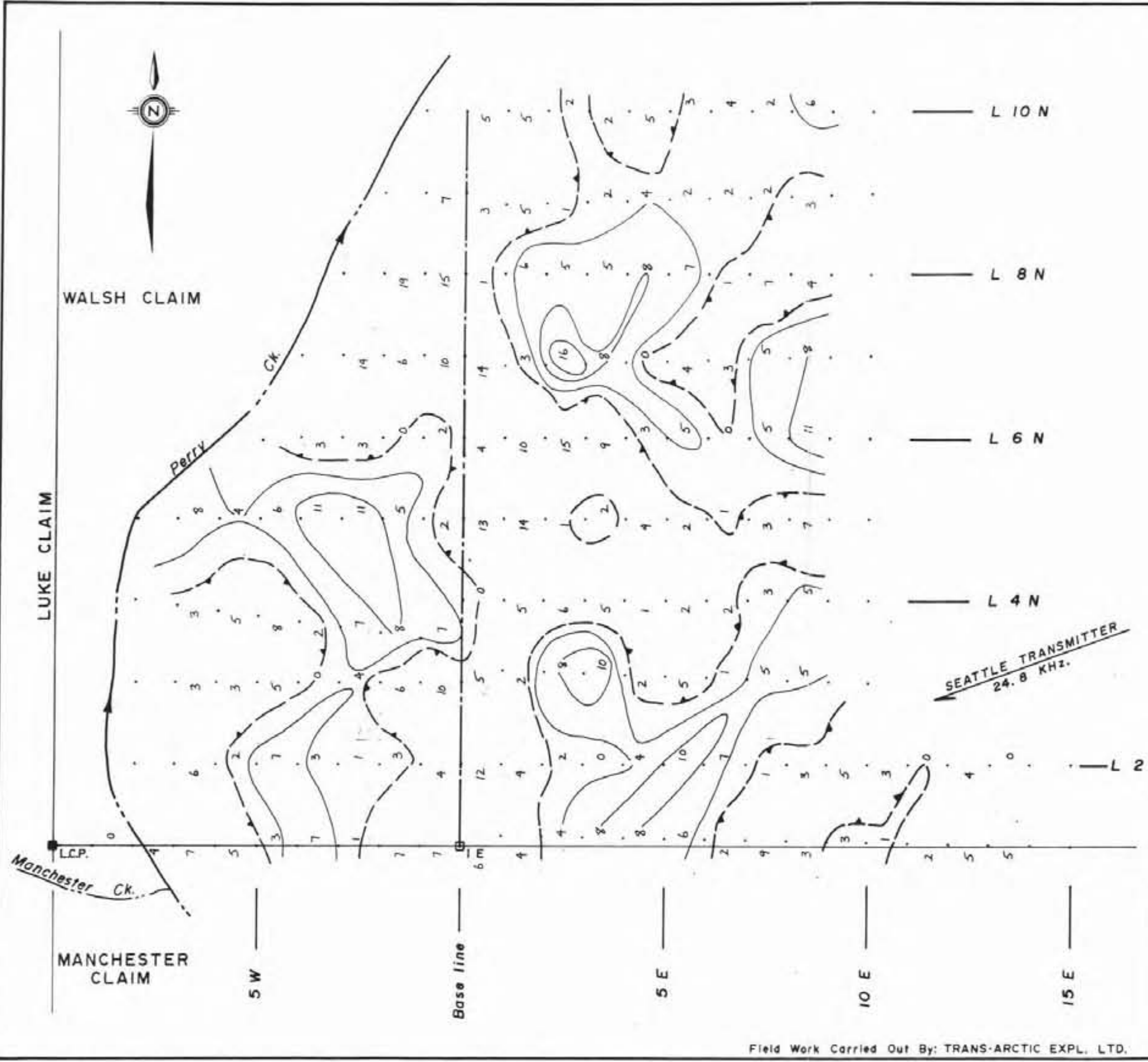
PERRY CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

VLF-EM SURVEY

RAW DATA & CONDUCTORS

SCALE: 1:5,000	DATE: Nov. 84.	MAP: 4	DRAWN BY: B.D.S.
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LEGEND

- Survey station
- > Creek direction
- Claim boundary

CONTOURS

- Interval: 4 degree
- 0 degree
- 4 degree and higher

Only positive values are contoured.
 Positive values on north side of line while
 negative values on south side.

N.T.S. 82 F/8 E



To Accompany Report By: DAVID G. MARK, Geophysicist

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WALSH & MANCHESTER CLAIMS

PERRY CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

VLF-EM SURVEY

FRASER FILITRED DATA & CONTOURS

SCALE: 1:5,000	DATE: Nov. 84.	MAP: 5	DRAWN BY: B. D. S.
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