84-#858 - 12928
7/85

GEOPHYSICAL REPORT

ON A

VLF-EM SURVEY

OVER THE

WELL 1, WELL 2 AND LEADER 4 CLAIMS

ANGUS CREEK, CRANBROOK AREA

FORT STEELE MINING DIVISION

BRITISH COLUMBIA

PROPERTY	: 26 km west of Cranbrook, B.C. on Angus Creek.
	: 49° 116° NE
	: N.T.S. 82F/8E, 9E
WRITTEN FOR	: TRANS-ARCTIC EXPLORATIONS LTD. 1807-1450 W. Georgia Street Vancouver, B.C., V6G 2T8
SURVEY BY	: TRANS-ARCTIC EXPLORATIONS LTD. 1807-1450 W. Georgia Street Vancouver, B.C., V6G 2T8
WRITTEN BY	: David G. Mark, Geophysic GEOTRONICS SURVEYS LTD. 403-750 West Pender Stre Vancouver, B.C., V6C 2T7
DATED	: October 9th, 1984

GEOTRONICS SURVEYS LTD.
Engineering & Mining Geophysicists
VANCOUVER, CANADA

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

SUMMARY

A VLF-EM survey was carried out over a portion of the Well 1 and Well 2 claims during the summer of 1984. The property is located 26 km west of Cranbrook, British Columbia on Angus Creek. Access to the property is easily gained by a two-wheel drive vehicle. The terrain consists of moderate to 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.

Covering most of the property and striking northeasterly occurs the Kitchener-Siyeh Formation composed of impure magnesium limestone, argillite, and calcareous quartzite. To the northwest and to the southeast occurs the Creston Formation, composed of argillites and quartzites. Acidic intrusives have been mapped on the west side of the property. On the adjacent 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 fault that this prospect occurs on, strikes through the center of the Well 1, Well 2, and Leader 4 claims in a southerly and southwesterly direction.

The VLF-EM readings were taken every 50 meters on 50-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 argillaceous quartzites, mica schist, and an acidic intrusive plug.

The VLF-EM survey has revealed one strong northerly-trending conductor that could be a portion of the fault on which the Leader A gold mineralization occurs. A westerly-striking conductor has been mapped across the fault conductor making this a prime area for gold exploration.

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.

GEOPHYSICAL REPORT

ON A

VLF-EM SURVEY

OVER THE

WELL 1, WELL 2 AND LEADER 4 CLAIMS

CRANBROOK AREA

FORT STEELE 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 Well 1 and 2 Claims during the period of June 25th to July 4th, 1984.

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 19.5 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 adjoining Leader A Claim.

PROPERTY AND OWNERSHIP

The property consists of three claims totalling 50 units staked within the Fort Steele Mining Division as shown on Map 2 and as described below:

Claim Name	No. Units	Record No.	Expiry Date
Well 1	18	1855	July 8, 1984
Well 2	12	1856	July 8, 1984
Leader 4	20	1914	Aug. 29, 1984
	50		

The expiry date shown does not take 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 26 km west of Cranbrook on Angus Creek.

The geographical coordinates are 49°31'N latitude and 116°09'W longitude.

Access is easily gained by travelling north from Cranbrook on Highway #95A to Marysville and then 15 km along an all weather road to the west running along the north side of the St. Mary River. A main logging road crosses the St. Mary River at the east end of St. Mary Lake. Two km east of the bridge one takes the Angus Creek road which runs southerly onto the property, a distance of 9 to 10 km.

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 moderate to steep partially logged slopes throughout most of the property. It lies across the northeasterly-trending valley of Angus Creek.

Elevations vary from about 1,640 meters a.s.l. at the Angus Creek tributary on the northern boundary of the Well 2 claim, to 2,350 meters a.s.l. within the southeast corner of the Leader 4 claim to give an elevation difference of 710 meters.

The main water sources would be Angus Creek as well as westerly-flowing and northerly-flowing tributaries of Angus Creek.

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 three claims have been staked, no work other than the VLF-EM survey 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. Sookochoff'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 - Angus 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, calcerous 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 calcerous 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 calcerous quartzite. Limestone and calcerous 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-Kirchener 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

Leech's G.S.C. map shows the Well 1, Well 2 and Leader 4 claims are principally underlain by the Kitchener-Siyeh Formation which trends northeasterly through the property. To the northwest and to the southwest the claims are underlain by the Creston Formation. The southwestern edge of the property is underlain by a Mesozoic or (?) Cenozoic acid intrusive.

There is no known mineralization on these claims. However, the fault on which the Leader A gold mineralization occurs strikes southerly and southwesterly through the Well 1, Well 2 and Leader 4 claims.

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 19.5 line km of VLF-EM survey of the property as shown on Map 2.

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.

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 in both an east-west direction and a north-south direction. The filtered results were subsequently plotted on Maps 5 and 6, 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 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 cross-over on the unfiltered data quite often shows up on the filtered data.

DISCUSSION OF RESULTS

1) Geology

Most of the rocks mapped within the survey grid are argillaceous quartzites. The eastern-mapped outcrops contain more argillaceous material and have been termed by Mr. Guy Royer as an argil-quartzite. The bedding strikes from true north to N40°E and dips westerly from 25° to 70°. On the eastern part of the survey grid, the dips at two locations were measured at 60° and 65° easterly, respectively. These rocks are probably of the Kitchener-Siyeh Formation.

On the southeastern part of the grid has been mapped mica schist striking northerly and dipping 65° to 75° easterly. There are also two occurrences within the argillaceous quartzite west of the baseline. The writer is unsure of which formation the mica schist is part of.

Also within the argillaceous quartzite near the mica schist has been mapped a small acidic intrusive plug.

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 closer to the same direction as the direction to 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.

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 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 5 and 6 are very interesting. There is especially a strong conductor shown on Map 5 that occurs to the immediate west of the baseline. This could well be the fault on which the Leader A mineralization occurs to the north. In support of this being a fault, the conductor occurs between two northerly-trending outcrops of argillaceous quartzite. This area is made more interesting by the westerly-striking conductor along the Well 1 and 2 boundary as seen on Map 6. Since both conductors cross each

other, this area becomes a prime region for further exploration of economic mineralization.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Geophysicist

October 9, 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, p. 70-71, 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 25th to July 4th, 1984.

5. I do not hold any interest in Trans-Arctic Explorations Ltd. nor in the Well 1, Well 2 and the Leader 4 claims, nor will I receive any interest as a result of writing this report.

David G. Mark
Geophysicist

October 9th, 1984

AFFIDAVIT OF EXPENSES

The VLF-EM and geological surveys were carried out from June 25th to July 4th, 1984 on the Well 1 and Well 2 mineral claims, south of Kimberley Area, Fort Steele Mining Division, B.C. to the value of the following:

FIELD:

1 day	- Supervisor	$ 200
10 days	- Geologist/Instrument operator @ $200/day	2,000
10 days	- Surveyors helper @ $125/day	1,250
10 days	- 4 X 4, 3/4 ton truck @ $90/day (includes oil and gas)	900
10 days	- Room and board in camp, 2 men @ $100/day	1,000
10 days	- Instrument rental (VLF-EM) @ $25/day	250
		$5,600

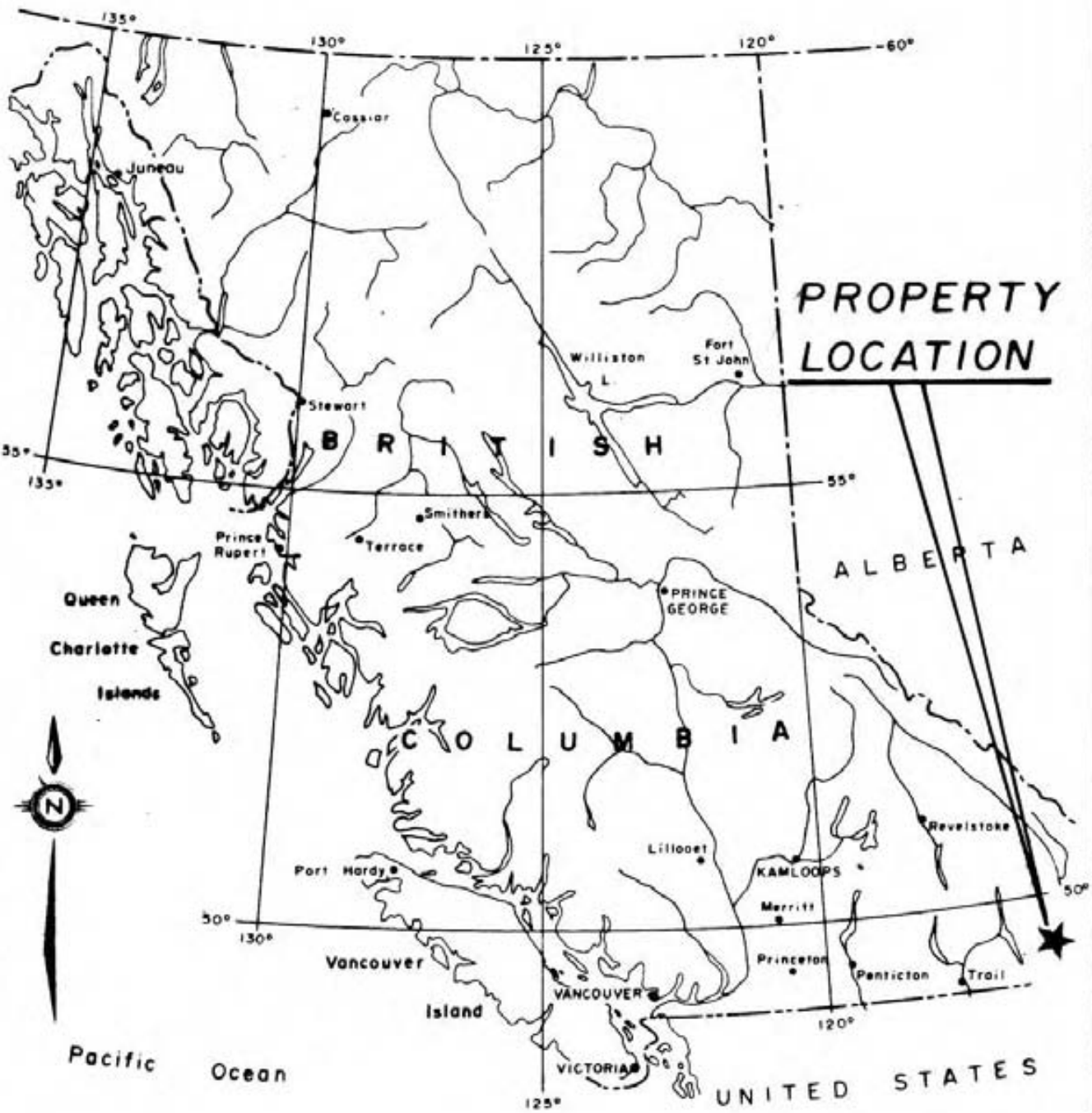
OFFICE:

Geophysicist, 13 hours @ $40/hr	$ 520
Geophysical technician, 20 hours @ $25/hr	500
Drafting and printing	400
Typing and photocopying	100
	$1,520

GRAND TOTAL $7,120

Respectfully submitted,
TRANS-ARCTIC EXPLORATIONS LTD.

E.A. Dodd,
President



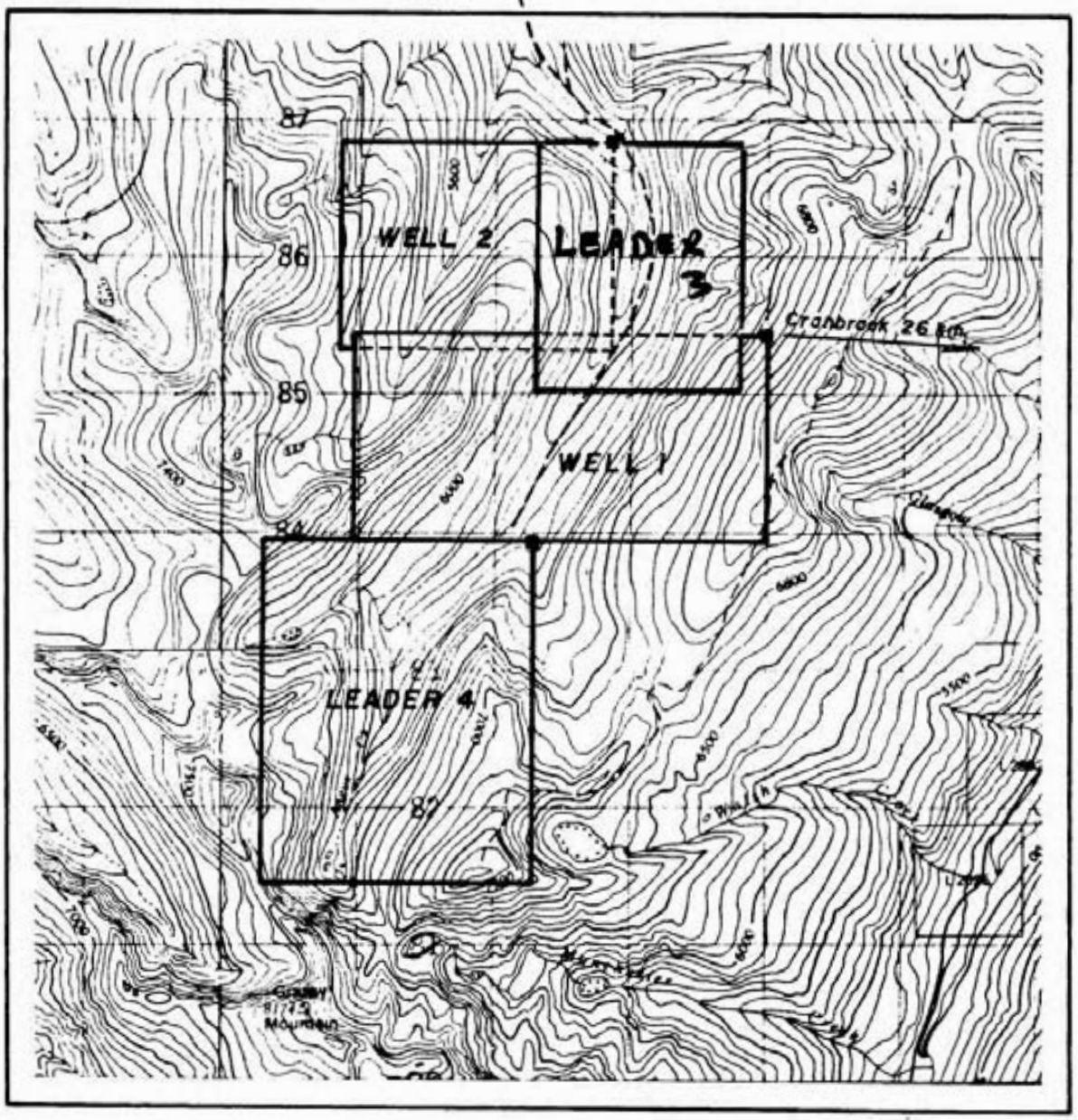
WELL 1, WELL 2 & LEADER 4 CLAIMS

100 0 100 200 300 400 Km

100 0 100 200 M.

MAP 1

BRAD'S DRAFTING SERVICE



TRANS-ARCTIC EXPL. LTD.

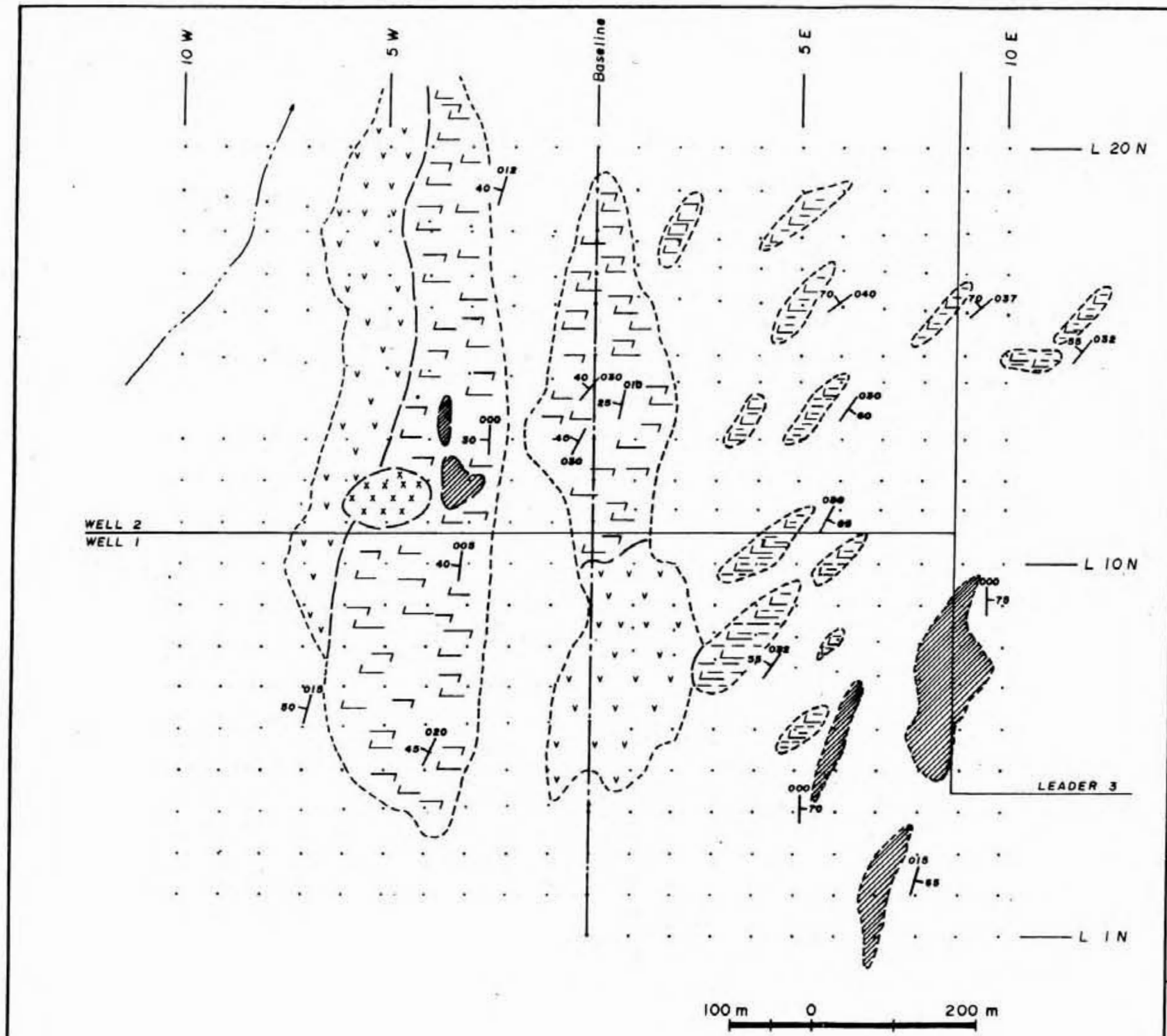
WELL 1, WELL 2 & LEADER 4 CLAIMS

ANGUS CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

CLAIM LOCATION MAP

SCALE:	DATE:	MAP:	N.T.S.
1:50,000	Oct. 84	2	82 F/8E, 9E



Field Work Carried Out By: TRANS-ARCTIC EXPLORATIONS LTD.

LEGEND

- Survey station
- Claim boundary
- Creek

LITHOLOGY

- Argillaceous quartzite
- Transitional argil-quartzite
- Mica schist
- Granitic intrusive
- Talus

To Accompany Report By: DAVID G. MARK, Geophysicist

TRANS-ARCTIC EXPLORATIONS LTD.

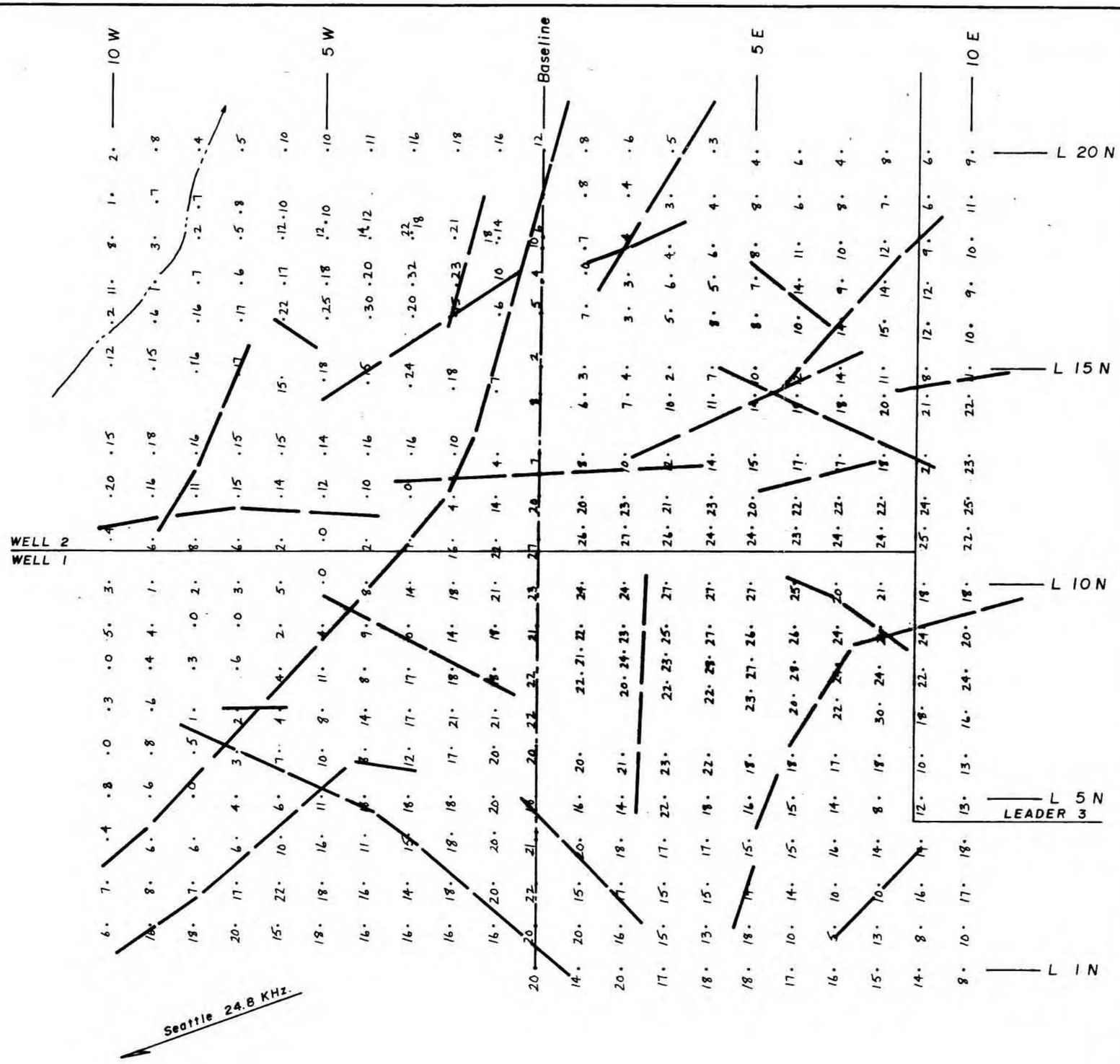
WELL 1, WELL 2 & LEADER 4 CLAIMS

ANGUS CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

DETAILED GEOLOGY

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



Field Work Carried Out By: TRANS-ARCTIC EXPLORATIONS LTD.

N

LEGEND

Claim boundary

Creek

Survey station

VLF-EM conductor

Positive value on upper side of line.
Negative value on lower side of line.

Conductors plotted from Fraser Filtered data.

INSTRUMENT: Sabre Model 27 VLF-EM

100 m 0 200 m

To Accompany Report By: DAVID G. MARK, Geophysicist

TRANS-ARCTIC EXPLORATIONS LTD.

WELL 1, WELL 2 & LEADER 4 CLAIMS

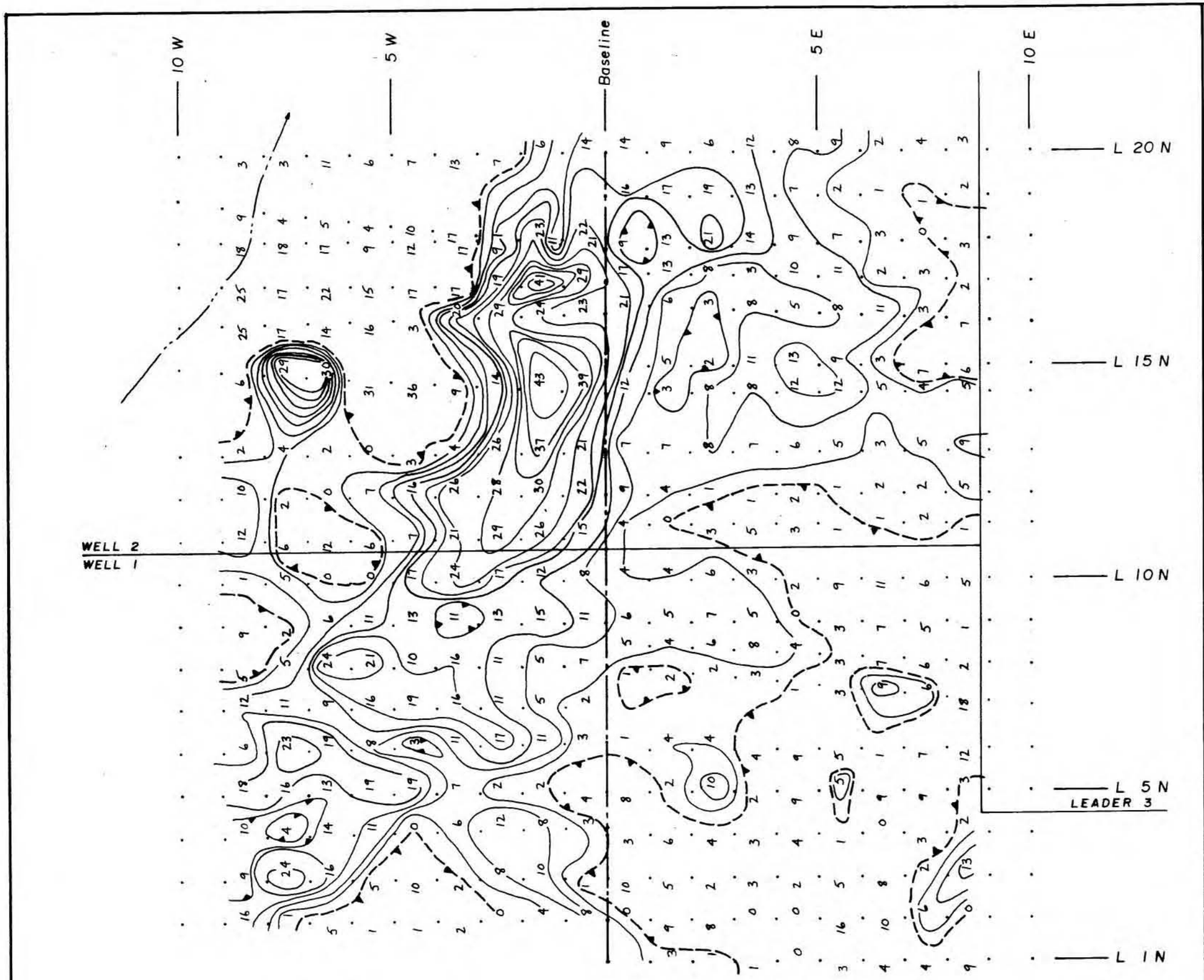
ANGUS CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

VLF-EM SURVEY

RAW DATA

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



(Positive values on upper side of line.
Negative values on lower side of line.)

Field Work Carried Out By: TRANS-ARCTIC EXPLORATIONS LTD.

LEGEND

Claim boundary

Creek

Survey station

CONTOUR INTERVAL

0° contour

4° and higher

Only positive values contoured

100 m 0 200 m

To Accompany Report By: DAVID G. MARK, Geophysicist

TRANS-ARCTIC EXPLORATIONS LTD.

WELL 1, WELL 2 & LEADER 4 CLAIMS

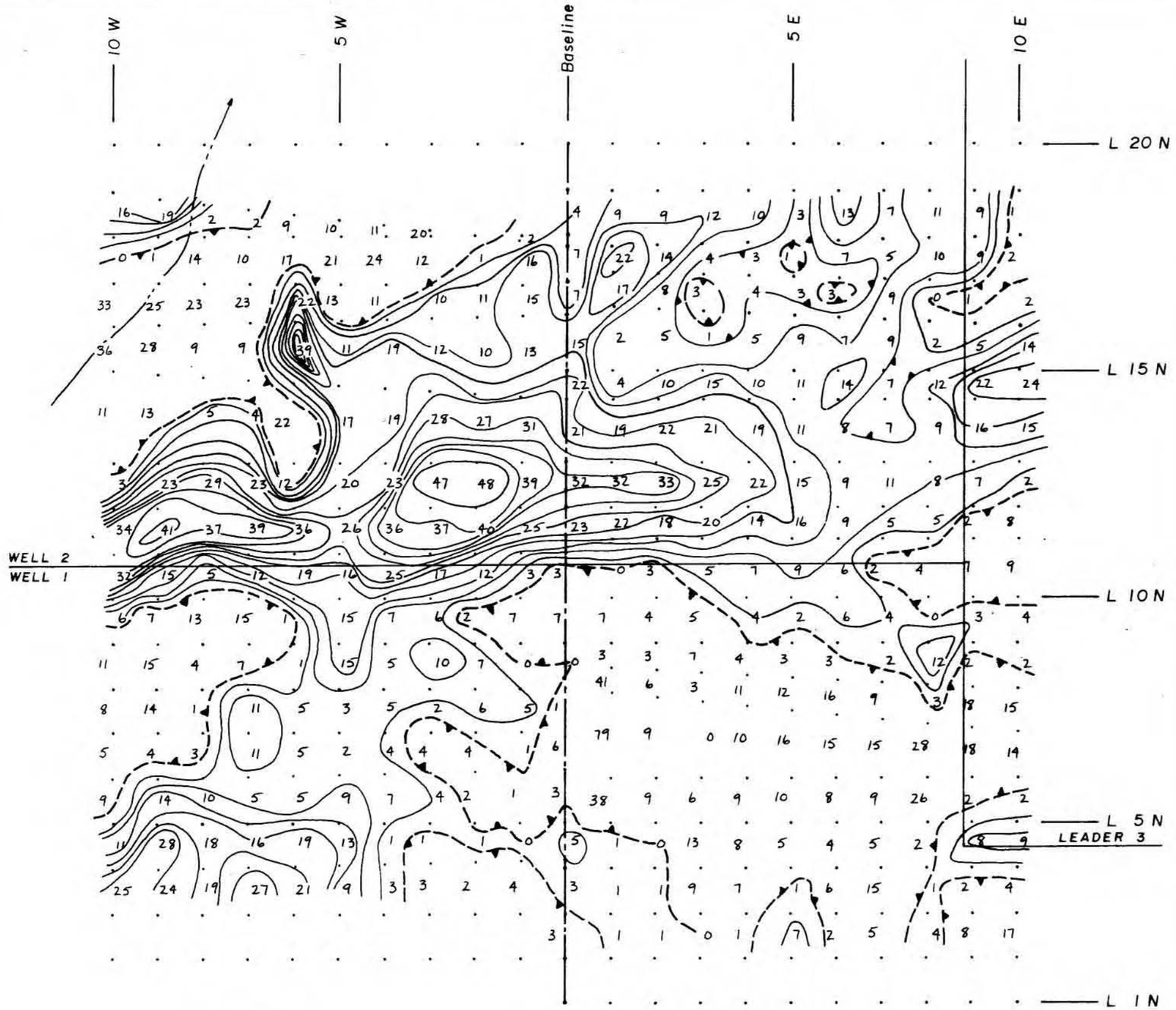
ANGUS CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

VLF-EM SURVEY

W-E FRASER FILTERED DATA & CONTOURS

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



Field Work Carried Out By: TRANS-ARCTIC EXPLORATIONS LTD.

N

LEGEND

Claim boundary

Creek

Survey station (Positive value on right / Negative value on left)

CONTOUR INTERVAL

0° contour

4° and higher

Only positive values contoured

100 m 0 200 m

To Accompany Report By: DAVID G. MARK, Geophysicist

TRANS-ARCTIC EXPLORATIONS LTD.

WELL 1, WELL 2 & LEADER 4 CLAIMS

ANGUS CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

VLF-EM SURVEY

N-S FRASER FILTERED DATA & CONTOURS

SCALE:	DATE:	MAP:	DRAWN BY:
1:5,000	Oct. 84.	6	B. D. S.