GEOPHYSICAL REPORT

ON A

VLF-EM SURVEY

07/86

OVER A PORTION OF THE

WELL 3 AND WELL 4 CLAIMS

ANGUS CREEK, CRANBROOK AREA

FORT STEELE MINING DIVISION

BRITISH COLUMBIA

PROPERTY	: 25 km N70°W of Cranbrook, B.C. to immediate east of Angus Creek.
	: 49° 34' North Latitude 116° 07' West Longitude
	: N.T.S. 82F/9E
SURVEY BY	: TRANS-ARCTIC EXPLORATIONS LTD. 1807-1450 W. Georgia Street Vancouver, B.C., V6G 2T8
WRITTEN FOR	: TUNSTALL RESOURCES INC. GEOTECH RESOURCES INC. 319-470 Granville Street Vancouver, B.C., V6C 1V5
WRITTEN BY	: David G. Mark, Geophysic GEOTRONICS SURVEYS LTD. 403-750 West Pender Stre Vancouver, B.C., V6C 2T7
DATED	: August 13th, 1985

GEOTRONICS SURVEYS LTD.
Engineering & Mining Geophysicists
VANCOUVER, CANADA

07/86

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LIST OF ILLUSTRATIONS

Note: Maps 3 & 4 are in writer's previous report.

SUMMARY

A VLF-EM survey was carried out over a portion of the Well 3 and Well 4 claims during the spring of 1985. The property is located 25 km N70°W of Cranbrook, British Columbia, to the immediate east of 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.

Most of the property lies to the immediate north of the easterly-striking St. Mary Fault. On its north side occurs Aldridge Formation quartzites, siltstones and argillites, alternating with Moyie Intrusive meta-diorites and meta-quartz diorites. On the south side of the fault and the southern part of the Well 3 claim occurs the Creston Formation, composed of argillites and quartzites. Acidic intrusives have been mapped to the west of the property. On the adjacent Leader A Claim occurs an auriferous quartz vein returning assays up to 0.598 oz/ton gold and 10.56 oz/ton silver across 0.58 m. Several mineral prospects occur on or near the St. Mary Fault including the nearby Rice prospect. Four of these apparently occur on the Well 3 claim.

The VLF-EM readings were taken every 20 meters on 100-meter separated north-south lines. The data was then reduced, plotted and contoured.

CONCLUSIONS

As written in the previous report, the writer considers the Well 3 and Well 4 claims are underlain by geology very favourable to gold mineralization for the following reasons:

1. The property occurs on and adjacent to the St. Mary Fault along which several mineral prospects occur. Four of these are on the Well 3 claim.

2. The claims are mostly underlain by alternating bands of Aldridge sediments and Moyie intrusives which are amenable to the occurrence of gold porphyrites.

3. The very promising gold prospect of the Leader A claim occurs to the immediate south.

The VLF-EM survey has revealed one stronger conductor, labelled 'c', that is of exploration interest because of its strength. Conductor 'd' is also of exploration interest since it suggests complex geological structure. Several other east-west conductors occur on the property that are probably reflecting faults and/or contacts between the Moyie Intrusions and the Aldridge Formation sedimentary rocks.

RECOMMENDATIONS

The following recommendations are virtually the same as those in the writer's previous report on the property, except that trenching has been added.

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 Moyie Intrusives as well as geological structure.

5) Anomalous areas should be trenched by 'cat' or backhoe.

6) 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

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WELL 3 AND WELL 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 3 and 4 Claims during the period of April 28th to May 6th, 1985.

The surveys were carried out by Trans-Arcitc Explorations Ltd. under the field supervision of Guy Royer, geologist, with the aid of Dean Bowra. A total of 20 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 two claims totalling 32 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 3	16	1857	July 8, 1986
Well 4	16	1858	July 8, 1986
	32		

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

The claims are owned by Geotech Resources Inc. and Tunstall Resources Inc., both companies of Vancouver, British Columbia.

LOCATION AND ACCESS

The property is located 25 km N70°W of Cranbrook British Columbia, to the immediate east of Angus Creek.

The geographical coordinates closest to the center of the property are 49°34'N latitude and 116°07'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 on the immediate west side of the property, a distance of 5 to 6 km. About 4 km along

the Angus Creek road before one reaches the Well 3 and 4 claims is an access road that leaves the Angus Creek road. Almost 2 km along this road is the northern boundary of the Well 3 claim.

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 westerly-trending valley of D Creek.

Elevations vary from about 1,430 meters a.s.l. on D Creek on the western boundary of the Well 3 claim, to 2,200 meters a.s.l. within the north central part of the Well 4 claim to give an elevation difference of 770 meters.

The main water sources would be Angus Creek as well as its tributary, the westerly-flowing D 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 two claims have been staked, 18.7 line km of VLF-EM survey were carried out in September, 1984, to the immediate southwest of the present survey. The results are in a report by the writer dated October 15th, 1984. Also a soil geochemistry survey has just been completed over the grid of last year's VLF-EM survey. The data is now being compiled.

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.

On the southern part of the Well 3 claim occur 4 mineral prospects on which physical work has undoubtedly been done.

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 stri-

king 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 3 and Well 4 claims occur on

and to the immediate north of the easterly-striking St. Mary Fault. On the north side of this fault occurs alternate bands of Moyie Intrusives and Aldridge sediments. The intrusives are meta-diorites and meta-quartz diorites and the sediments are comprised of rusty weathering and grey weathering quartzites, siltstones and argillites. The south side of the fault on the Well 3 claim is underlain by the Creston Formation composed of argillites and quartzites. Immediately west of the property occurs Mesozoic or (?) Cenozoic acid intrusives.

Several mineral prospects occur on or close to the St. Mary Fault, one example being the gold-bearing Rice prospect which occurs 1.5 km east of the Well 4 claim. Also Leech shows 4 mineral prospects occurring within the Well 3 claim on the St. Mary Fault but he doesn't say what the mineralization is.

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 20 line km of VLF-EM survey of the property as shown on Map 2. The survey area occurs to the immediate northeast of the previous survey and extends across the southern part of the Well 3 and 4 Claims.

The base line, on a bearing of due east, was extended for 1900 m being well flagged with survey flagging. The survey lines were run perpendicular to the base line (north-south) at a 100 m spacing. The instrument readings were taken every 20 m along the survey lines facing towards the transmitter at Seattle.

COMPILATION OF DATA

The VLF-EM field results were plotted on Map 5 at a scale of

1:4,000. They were then reduced by applying the Fraser-filter, the results of which were subsequently plotted on Map 6 (at the same scale) between the 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) General

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.

One notices a definite trend in an east-west direction for the conductors. This is at least partly the result of the grid bias. That is, the readings are 5 times more frequent in the north-south direction as they are in the east-west direction which will result in elongating the contours in an east-west direction.

There is some variation in intensity within each VLF-EM anomaly and 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 sometimes 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.

2) Well 3, Well 4 Survey

As can be seen on map 6 (contour map of Fraser-filtered data), there is a definite east-west trend to the anomalies. It is felt that these reflect east-west trending conductors that have been enhanced along the strike direction by the grid bias. A quite likely cause of these conductors are the faults and/or contacts separating the Moyie Intrusives from the Aldridge sediments. It is probable that the fault/contacts have been influenced by the parallel east-west trending St. Mary fault which occurs just south of the survey area.

Two conductors that stand out above the other conductors are those labelled c and d on map 6. (The letters a and b have been used to label conductors on the adjacent survey.) Conductor c is stronger than any other conductor and appears to extend east-

northeasterly off of the survey area. Conductor d is a complex anomaly that actually appears to be composed of several conductors.

There are several parts of many of the conductors that are more intense (contain higher values), the best one being c. As mentioned above, these could be areas where mineralization may occur and therefore are of greater exploration interest.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Geophysicist

August 13, 1985

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Minister of Mines Reports
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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 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 April 28th to May 6th, 1985.

5. I do not hold any interest in Geotech Resources Inc. nor in Tunstall Resources Inc. nor in the Well 3 and Well 4 claims, nor will I receive any interest as a result of writing this report.

David G. Mark
Geophysicist

August 13th, 1985

AFFIDAVIT OF EXPENSES

The VLF-EM survey was carried out from April 28th to May 6th, 1985, on the Well 3 and Well 4 mineral claims, south of Kimberley Area, Fort Steele Mining Division, B.C. to the value of the following:

FIELD:

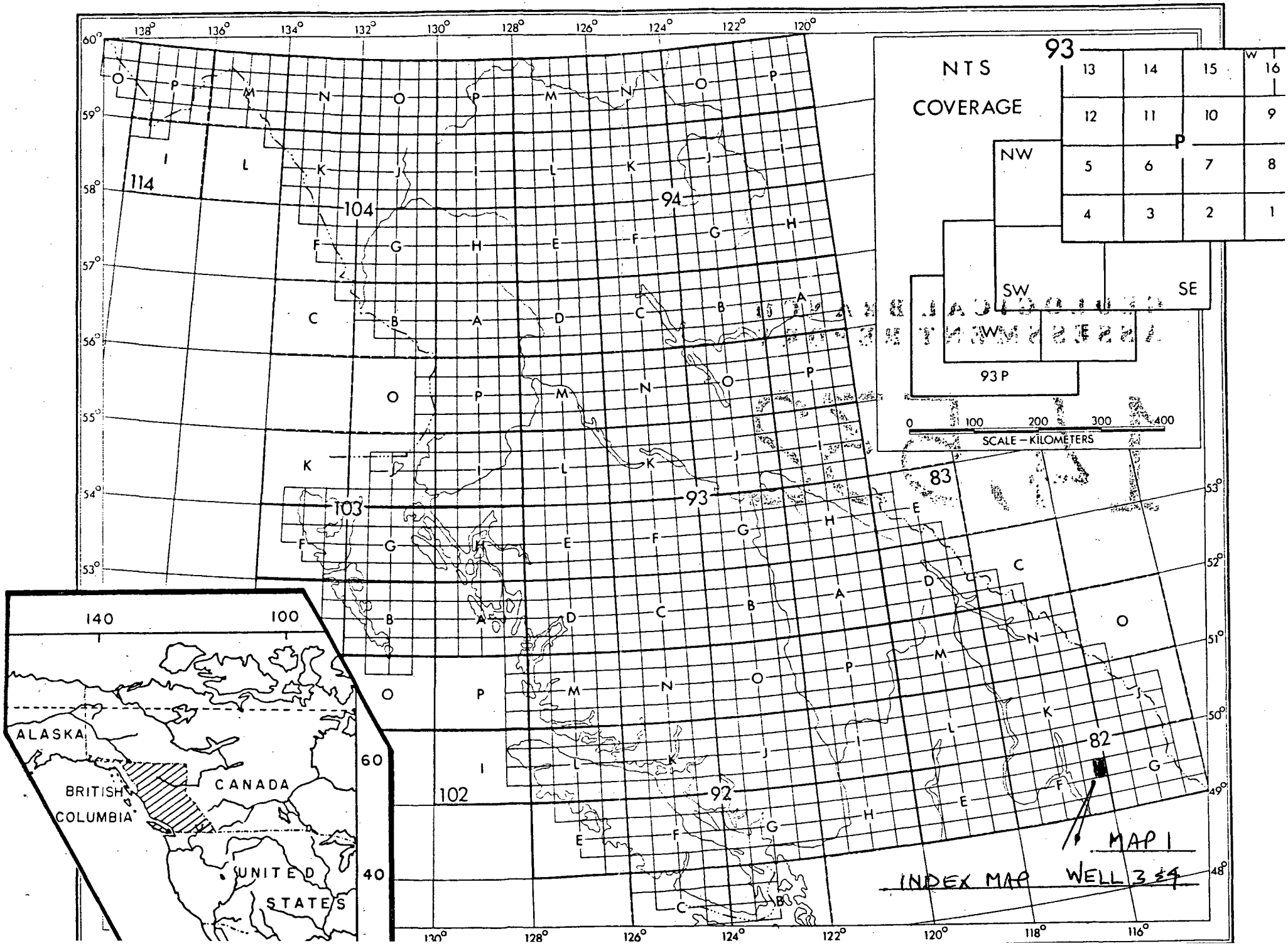
Supervisor, 2 days @ $200/day	$ 400
Geologist/Instrument operator and helper, 69 hrs. @ $40/hour	2,760
4 X 4, 3/4 ton truck, 9 days @ $110/day (includes oil and gas)	990
Room and board, 9 man-days @ $50/man-day (for 2 men)	900
Instrument rental (VLF-EM), 9 days @ $25/day	225
Survey supplies	150
	$5,425

OFFICE:

Geophysicist	$ 500
Geophysical technician	400
Drafting and printing	300
Typing and photocopying	100
	$1,300
GRAND TOTAL	$6,725

Respectfully submitted,
TRANS-ARCTIC EXPLORATIONS LTD.

R. Simpson,
Manager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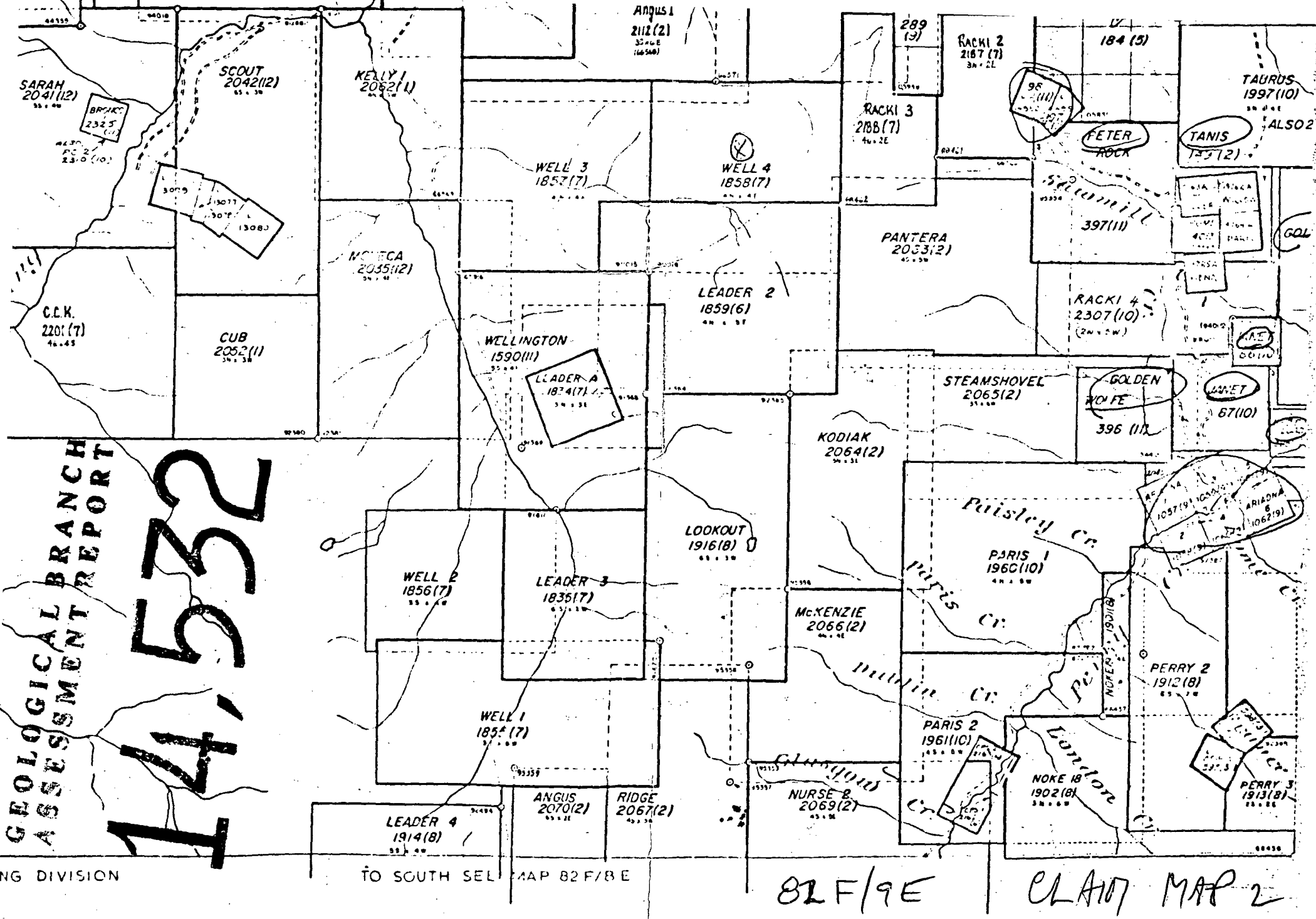
93
13 14 15 16
12 11 10 9
P
5 6 7 8
4 3 2 1
NW
SW
SE
93 P
0 100 200 300 400
SCALE – KILOMETERS
114
104
94
103
93
83
102
92
82
ALASKA
BRITISH COLUMBIA
CANADA
UNITED STATES
MAP 1
INDEX MAP WELL 3 & 4

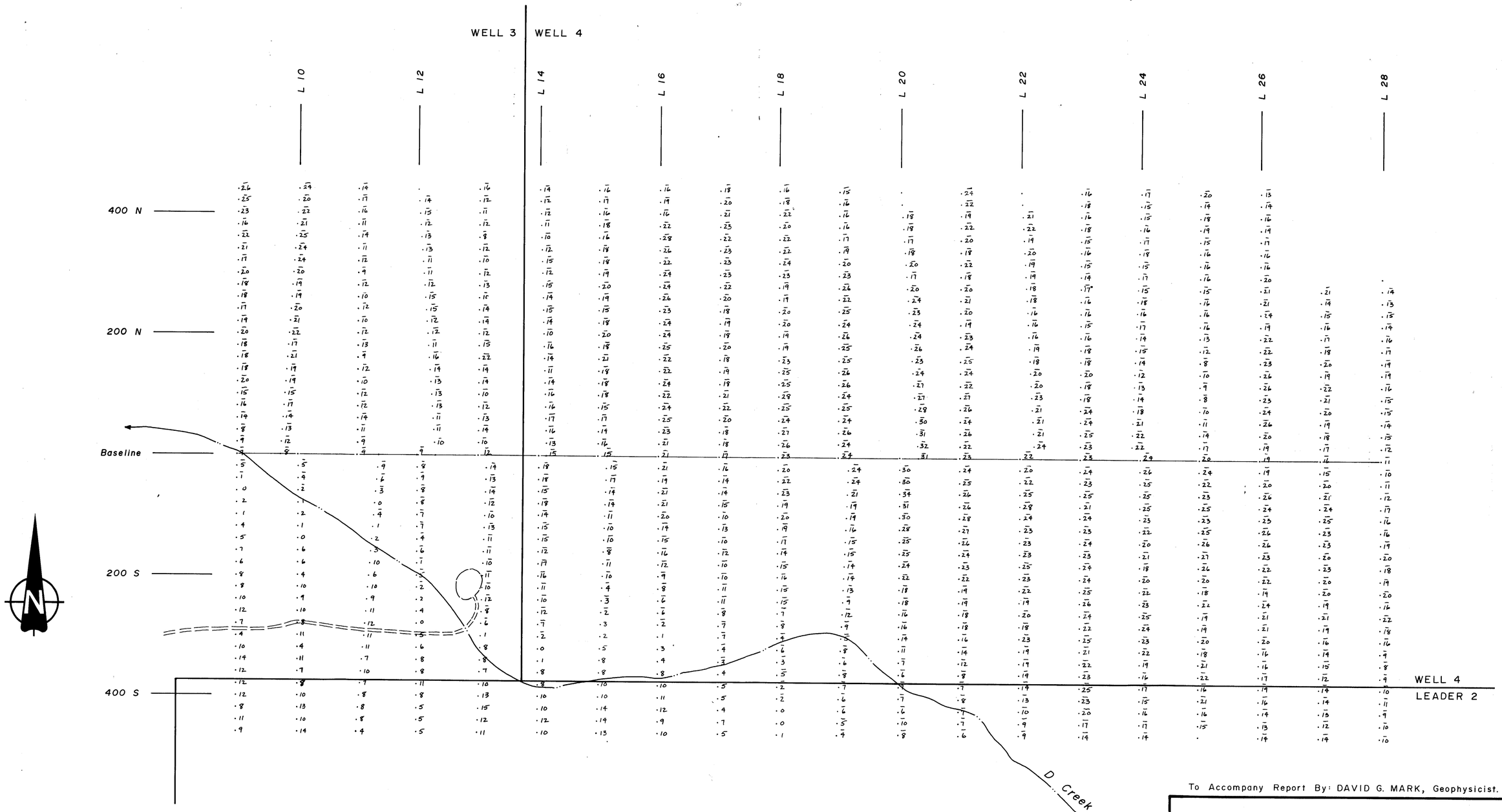
GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,532



NG DIVISION

DEPARTMENT OF MINES AND PETROLEUM RESOURCES



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

TRANSMITTER DIRECTION

Seattle
24.8 KHz.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

14,532

200 m 0 200 m

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

LEGEND

- Survey station.
- Claim boundary.
- Creek.
- Road.

TUNSTALL RESOURCES INC.
GEOTECH RESOURCES INC.

WELL CLAIM GROUP

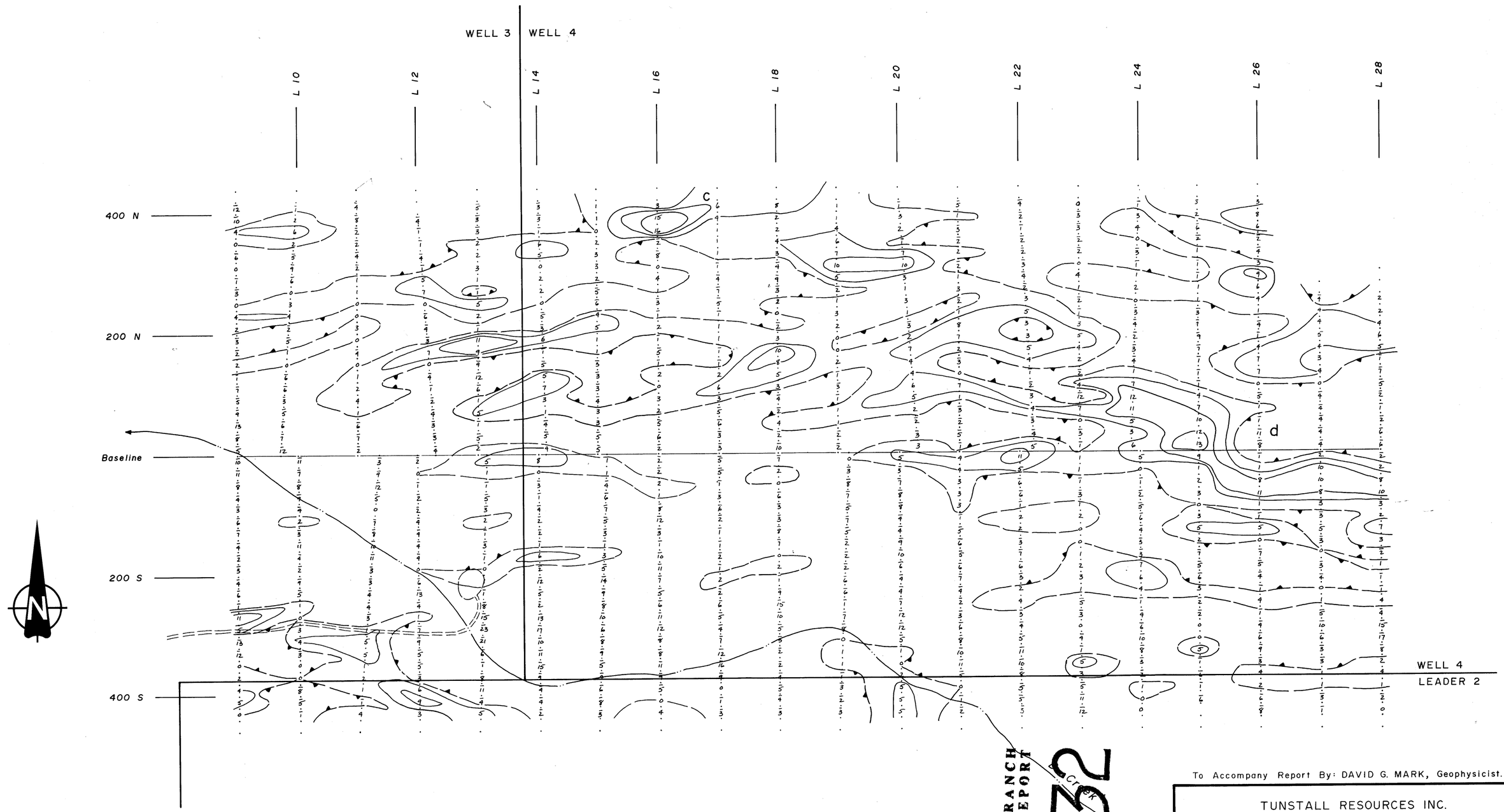
ANGUS CREEK, CRANBROOK AREA

FORT STEELE M.D., B.C.

VLF-EM SURVEY

RAW DATA

SCALE:	DATE:	N.T.S.	MAP:	DRAFTED BY:
1:4,000	Aug. 85.	82 F/9 E	5	B.D.S.



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

TUNSTALL RESOURCES INC.
GEOTECH RESOURCES INC.

WELL CLAIM GROUP

ANGUS CREEK, CRANBROOK AREA

FORT STEELE M.D., B.C.

VLF-EM SURVEY

FRASER FILTERED DATA & CONTOURS

SCALE:	DATE:	N.T.S.	MAP:	DRAFTED BY:
1:4,000	Aug. 85.	82 F/9 E	6	B. D. S.

LEGEND

- Survey station.
- Claim boundary.
- Creek.
- Road.

TRANSMITTER DIRECTION

Seattle
24.8 KHz.

CONTOUR INTERVAL

- 0 degrees.
- 4 degrees and higher.
- Depression.

200 m 0 200 m

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