ASSESSMENT

GEOLOGICAL

REPORT

ON

[AIRPHOTO FRACTURE DENSITY ANALYSIS]

ON THE

PERK GROUP OF MINERAL CLAIMS

(PERK 1/4584 - PERK 2/4585 - PERK 3/4586 - PERK 4/4587)

PERKINS PEAK AREA

KLEENA KLEENE, BRITISH COLUMBIA

CARIBOO MINING DIVISION

51 48'N : 125 05'W : 92N14E

FOR

R.R. DION

February 6, 1984

Gerhard von Rosen, P.Eng.

TABLE OF CONTENTS

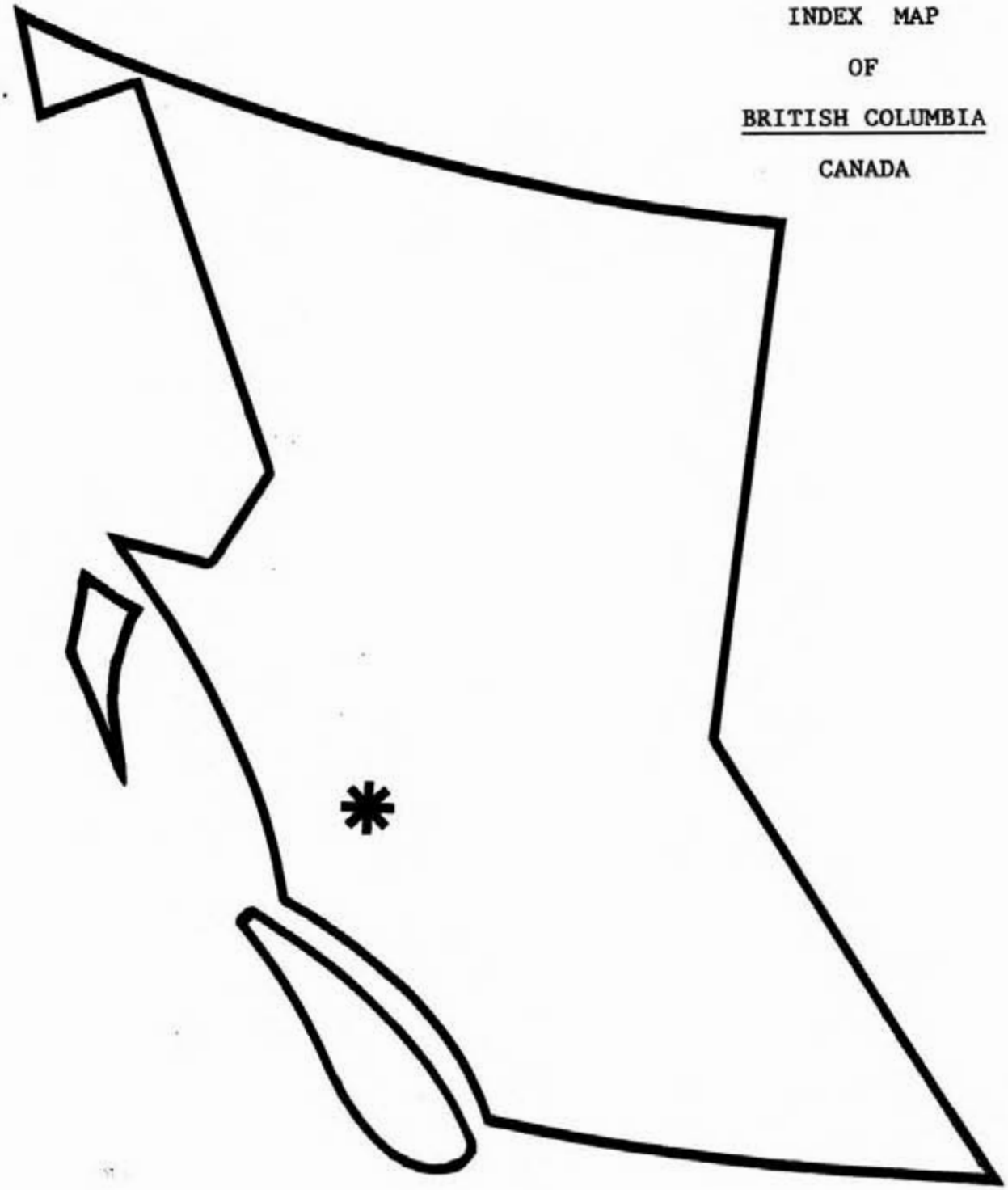
FIGURE "A"

INDEX MAP

OF

BRITISH COLUMBIA

CANADA



PERK GROUP MINERAL CLAIMS

PERKINS PEAK CARIBOO M.D.

INTRODUCTION

At the instruction of Robert Ross Dion, the writer set out to perform a fracture density analysis on the PERK group of mineral claims. The ressults of this work are summarized in the present report for assessment purposes.

The writer commissioned D.A. Chapman to annotate the vertical colour airphotographs, perform the point-count of the isostatic traces, carry out the relative-density calculations, and provide the plan of relative density isogradients, in addition to interpreting the indicated shear tension fault zones.

PROPERTY HOLDINGS

This assessment report supports assessment work requirements for one year on the PERK group of mineral claims. The colour airphoto stereopair which was employed for this project included more than the subject claims, however the total area is here shown as gold showings are known to occur on the north flanks of the Perkins Peak massif, off the present claim group.

CLAIM NAME	RECORD #	UNITS	ANNIVERSARY
PERK 1	4584	6	November/84
PERK 2	4585	12	November/84
PERK 3	4586	6	November/84
PERK 4	4587	4	November/84

CARIBOO MINING DIVISION NTS: 92N14E

The anniversary, shown, applies after the present assessment report has been accepted towards one year's credits.

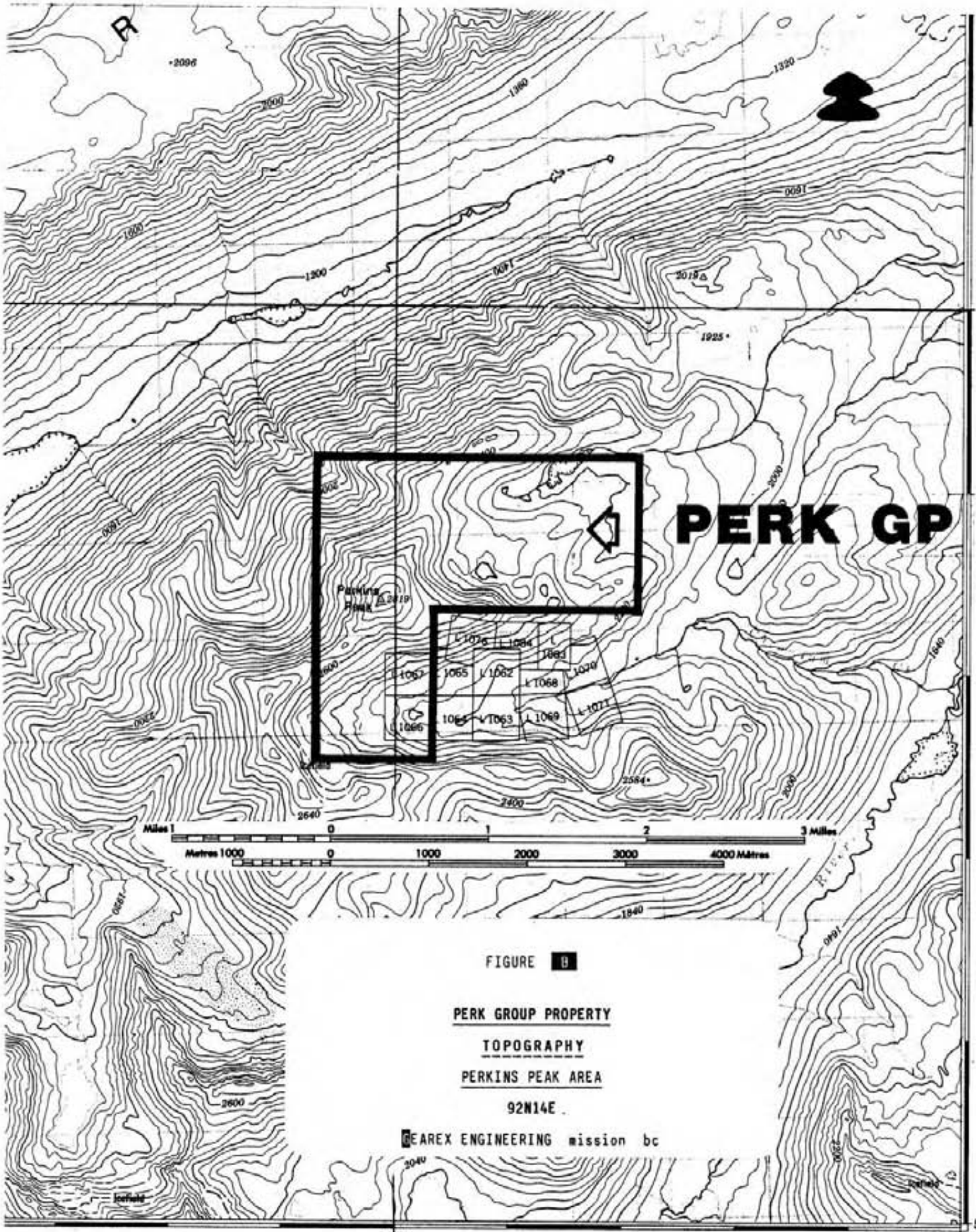


FIGURE 8

PERK GROUP PROPERTY

TOPOGRAPHY

PERKINS PEAK AREA

92N14E

EAREX ENGINEERING mission bc

LOCATION & ACCESS

51 48'N 125 05'W NTS: 92N14E

The PERK GROUP is centered around Perkins Peak which lies about 17 km southwest of Kleena Kleene, B.C., about 224 km west of Williams Lake, B.C. The property can be reached via about 50 km of 4x4 road starting starting from the Williams Lake-Bella Coola highway (256 km west of Williams Lake) at a point about 2.5 km west of Chilanko Lodge on One Eye Lake.

Access on the property is by helicopter, and mountain climbing, although a tote-road exists up Chromium creek to the Crown Grants southeast of the PERK GROUP, and another one supplies access to the gold property to the north of the group.

PHYSIOGRAPHY, VEGETATION, CLIMATE

Perkins Peak rises to 2820 mASL at the western edge of the Interior Plateau defining the beginning of the Coast Range. This locality is thus also the interface between the moist coastal and the dry interior climates. Precipitation in the form of snow remains almost perennially on the northern slopes. Vegetation is scarce.

OVERLAY ON FIGURE "B"

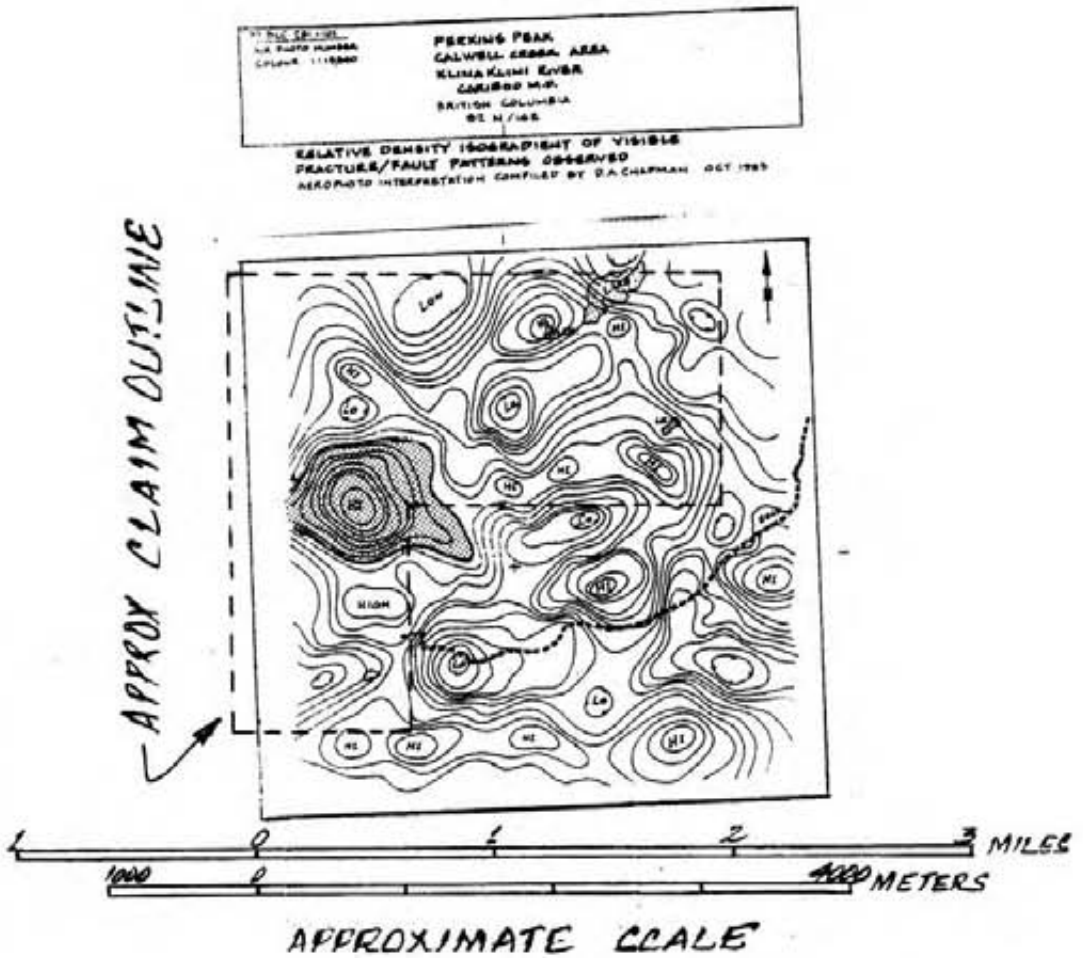


FIGURE C

PERK GROUP PROPERTY

COMPILATION PLAN

PERKINS PEAK AREA

92N14E

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HISTORY

A gold-silver property on the northeastern flanks of Perkins Peak has been known by various names over the years, the most common being: Mountain Boss. The first mention of this is in the 1916 Annual Report of the British Columbia Department of Mines, and references follow for the years since then. The present writer inspected the gold showings in August of 1977.

The Crown Grants at the head of Chromium Creek were staked for their iron content as explained in the 1922 BCDM Annual Report, page G218.

> "...The group of claims occupies the whole of the glacial cirque at the head of Chromium creek and the boundaries extend down that creek on both banks for a very considerable distance,..The entire group of claims is about 1,000 feet above timber-line, which fact led to the construction of a large rock cabin for a mine camp...
> ...It is very difficult to form any opinion as to the extent of the deposits of haematite-iron ore, because, although several open-cuts have been made across the mineralized zone, none of these were deep enough to expose bed-rock...
> ...The only development-work besides the open-cuts is a crosscut adit described by Galloway (1916) as being 600 feet long, but which in 1921 could not be examined because its caved condition made it impossible to enter...
> ...Conclusions- ...but that the evidences of mineralization are so pronounced and cover such a large area, not being merely confined to Chromium Creek deposits, as to make the section quite attractive to prospectors for other minerals than iron ore.
> In the event of other discoveries being made in the zone of contact represented in the section, such might develop into mines having sufficient commercial value to warrant the improvement of the transportation facilities to a point where the iron ore could be mined profitably..."

The writer is unaware of any further exploratory work in the area of the claims, except for the possible overlap of aerial surveys done on neighbouring properties.

GENERAL GEOLOGY

Appendix B is a plan showing the generalized geology of the area.

The claimed area is underlain [Tipper, 1968] by a sequence designated by rock Units 12 and 13, intruded by Coast Plutonic rocks (Unit B).

Unit 13, andesitic and basaltic breccia and tuff, with minor shale, greywacke and conglomerate, is underlain by Unit 12, siltstone, greywacke and conglomerate.

The gold-silver showings of the Mountain Boss property occur within Unit 12 which locally consists of light coloured quartzite, and black or dark grey argillaceous sediments, some of which are limy. The attitude of these sediments is about E-W with southward dip of 45 degrees. Basic dikes cut the sediments, and light coloured dikes and thick sills occur on other portions of the property. Quartz lenses follow along shearing which generally trends parallel to the bedding of the sediments. Some quartz veins also cut the bedding at irregular attitudes. Silification is widespread. Calcite occurs within the quartz and silicified wall rock.

Arsenopyrite-pyrite and some chalcopyrite associated with quartz occupy fractures which dip steeply to the north within the silicified quartzite sedimentary bed which dips south striking east.

The hematite showings on Chromium creek are described in the 1922 AR of the BCDM as follows:

> "...Geology-...A considerable portion of these slides is made up of float iron ore in pieces varying in size from gravel to large lumps...
> The country-rock in the vicinity of the group of claims is chiefly argillite, which has in many places been intruded by the granitic rocks of the Coast Range. The zone

continued: GENERAL GEOLOGY

of contact between the granitic rocks and the older sedimentaries and volcanics is fairly well defined in the locality of the occurrence of the iron-ore deposits which Galloway (1916) considers are of contact-metamorphic origin..."

AIRPHOTO FRACTURE DENSITY ANALYSIS

PURPOSE

Colour, vertical airphotographs provide valuable information in many ways to the explorationist, one of which derives from the stereoscopic study of straight, and/or arcuate lineations, caused by stress-relief ruptures within the bedrock at the surface of the earth. It has been postulated that the relative density per unit area of these lineations is an indication of the open-ness of the rocks to the influx of mineralizing solutions. Hence, the premise that the study of fracture density may give the exploration geologist another tool to be used in defining exploration targets.

POSSIBILITIES OF THE METHOD

Large-volume "porphyry copper" type deposits tend to include ore mineral disseminations in stockwork fractures within granitic, volcanic, or other metamorphosed rocks at, or near intrusive contacts of granitic bodies. Because ore-metallization appears to be related to rock-type contacts and changes in frac-

continued: POSSIBILITIES OF THE METHOD

ture density, this study was undertaken to attempt outlining of rock types, and pinpointing anomalously fractured zones.
This method, when used in conjunction with other information, such as geophysics or geology, can be utilized to outline areas of interest with minor unit-area expense.

LIMITATION OF THE METHOD

Heavy snow cover and overburden tend to obscure the finer fracture details, although major trends will show through most surficial deposits.
Rock types fracture in different patterns, and each has a special signature. When lithologic boundaries are unknown to the interpreter then there may be difficulty in differentiation between fracture density increases caused by anomalous tectonic action within a homogeneous lithologic unit, or by simply changes in rock type. In the first case, additional fracturing may be of interest, while in the second instance, a non-mineralized rock body may exhibit more bdding, schistosity, and joints, without enhancement of the ore-hosting process.
Although fracture density anomlies could be assumed to always indicate zones more worthy of interest to the explorationist, it must be realized that metallization of favourable host rocks has been known to occur in moderately-fractured rocks.
In the present study only apparently vertical fractures have been annotated by D.A. Chapman. Furthermore, their on-strike extrapolations have been connected to form semi-continuous lineations.

METHOD OF ANALYSIS

The following vertical, colour airphotographs, obtainable from the Map Division, Parliament Buildings, Victoria, B.C., were chosen to provide stereoscopic coverage of the area required:

Colour-30BCC281:#101 & #102

Flown: July 4, 1981

A plastic overlay was attached to #101 and marked in such a way that reorientation can be done accurately, using Perkins Peak, a road, and two lakes as tie-points. The scale on the airphoto overlay varies with distance from the center, and especially with camera-object distance. Hence large variation in scale is to be expected between the peaks and valleys.

POINT COUNT

In order to facilitate quantifying this information a method has been devised [Tait Blanchet, D.A. Chapman] whereby the airphoto overlays (annotated with the traced lineaments) are divided by an orthogonal grid, - with 1 cm dimensions in this particular case. The grid is carried on a separate overlay. A moveable circle template, with diameter 1 cm, is then centered on each of the grid points, and the quantizing of the fracture information commences. Following is the method of valuating the lineations:

All traced fracture segments are counted:

a) fractures that cross the circumference of the circle <u>once</u> are given <u>one</u> point.
b) ...<u>twice</u> are given <u>two</u> points.
c) ...<u>not</u> crossing are given 1/3 points.

continued: POINT COUNT

The result of quantizing the visible isostatic traces is displayed at 'unit area sample centers' on the Appendix plan designated: Sheet 2 of 4.

RELATIVE DENSITY ESTIMATE

The relative density estimate of 'visible fracture/fault patterns' observed, is shown as Appendix Sheet 3 of 4.
This is a plan depicting arithmetically-obtained interpolated mean values observed between surrounding unit area samples.
This information is akin to the taking of the first derivative of the point count information, and as such is 'filtered' data.

RELATIVE DENSITY ISOGRADIENT

The process of contouring equal-value locations on the survey plan provides the isogradient of the relative density of visible fracture/fault patterns observed on the subject airphoto. This information is here shown as Appendix Sheet 4 of 4.

INDICATED SHEAR-TENSION FAULT ZONES

An overlay on Sheet 4 of 4 is a plan showing the indicated 'probable tension/shear faults' as interpreted from the data by Mr. Chapman.

RESULTS OF STUDY

The relative density isogradient is shown as contoured areas of 'high' and 'low' value zones.

It is apparent that immediately east of Perkins Peak is the locality of a large 'high'. This is further circumscribed by arcuate lineations. Several 'bird's eye' high areas dot the remaining survey area.

Indicated shear tension fault zones flank most of these 'high' areas, and trend north-westerly and north-easterly, the latter direction showing prominence in being continuous through the subject area.

DISCUSSION OF RESULTS

The geologic map, Appendix "A", shows that the bedding contact between Units 12 & 13 passess through the property in an almost E-W direction, skewing somewhat north-easterly. This bedding attitude would approximately disect the angle between the 'indicated shear tension fault zones'.

Location of intrusive plugs, and contact metamorphic relationships is not shown on this general geological presentation.

This method of quantizing fracture density determinations has been effectively utilized to outline those areas exhibiting higher-than-average (relative to the survey area) changes in fracture density. It allows examination of stress-strain related patterns of the rocks underlying a large area, at very reasonable cost.

CONCLUSIONS

1) The ground immediately north of the end of the mine road shown on Sheets 1-4, is spotted with several open cuts. These relate to the exploration activity on the Crown Grants at the head of Chrome creek, which reportedly was for hematite at a metamorphic contact.
   The zone up-slope from these open cuts shows up as a small-order 'high' on Sheet 4/4. This smaller high coalesces with the large-area, large-order 'high' on the south-east flank of Perkins Peak.

2) The above-mentioned zone futhermore occurs on, or near the through-going, north-east trending indicated shear tension fault zone shown on Overlay Sheet 4. A north-westerly trending indicated fault zone passes northwesterly towards Perkins Peak from this area.

3) The recommendations by D.A. Chapman, as shown in the appendix, are:
   "Prospecting traverses should be along the preferred shear zones. These deep-seated faults offer the most likely zones where mineralization will occur.
   a) Geological prospecting should be supported with rock geochemistry.
   b) A VLF-EM unit should be used at intervals across the strike in conjunction with soil geochemistry in areas where overburden exists.
   Further airborne work over the claim area, using low level magnetometer-VLF-EM geophysical surveys, could be performed."

RECOMMENDATIONS

As the claimed area includes Perkins Peak, work on the property must be performed by personnel skilled in mountaineering. In addition to prospecting and geological sampling, soil and silt sampling in creeks, and at the base of scree slides, especially along the contact, and fault zones, is recommended. Helicopter-borne electromagnetic, and magnetic surveys now utilizing sophisticated, state-of-the-art technology, can be utilized in this area, especially where contact zones, and conductive veins could be suspected.

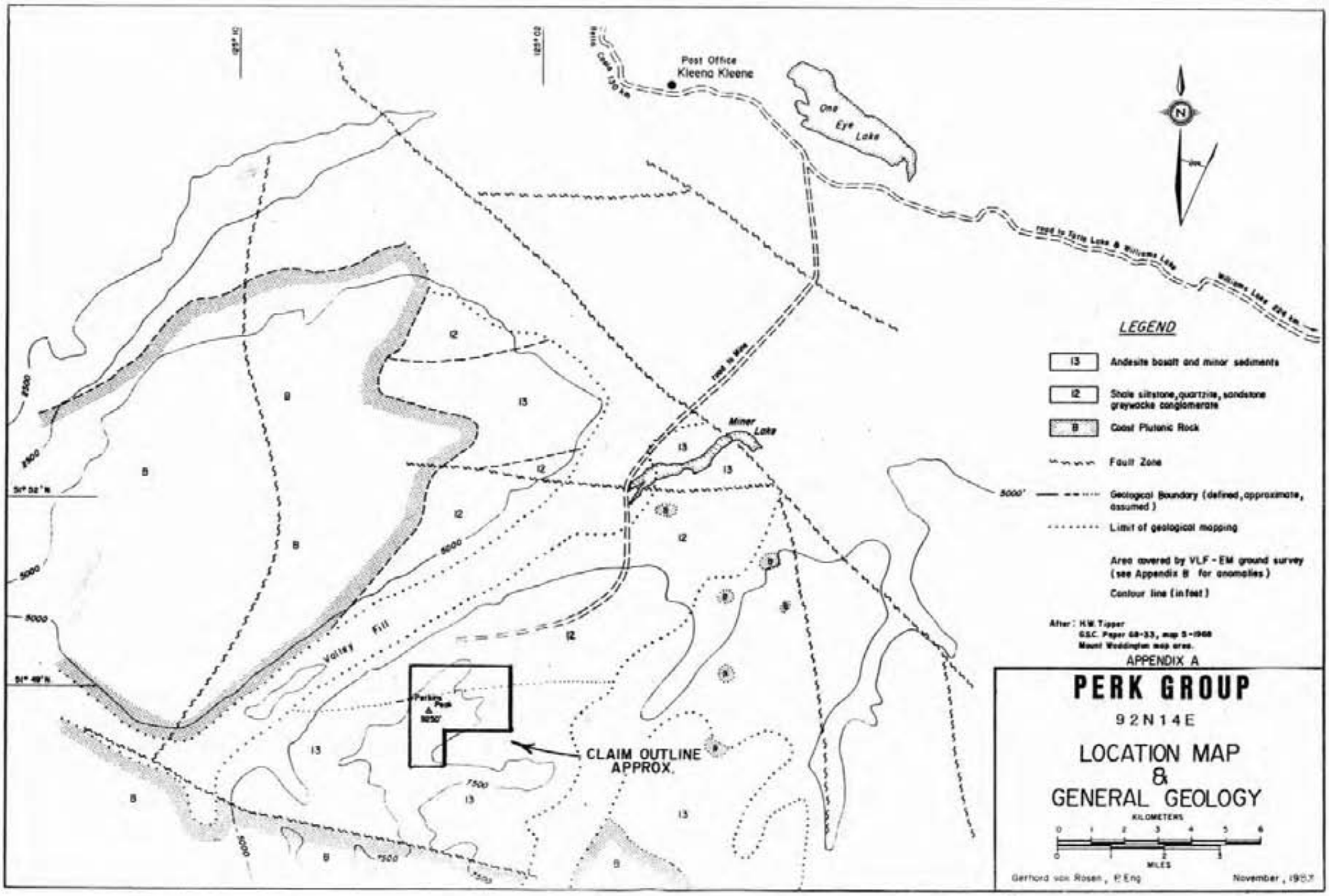
Two sectors of the claimed area appear to be of interest under the parameters of this study. They appear as co-incident 'high' values, as shown on Figure C, with areas within arcuate traces, as shown on Appendix Sheet 1 of 4.

The first of these interesting areas lies just easterly of Perkins Peak, while the other shows up as a smaller size 'high' located southwest of the isolated small lake, and trending northerly towards the larger lake.

These two areas could serve as a focus of exploration, while the remainder of the property is prospected.

APPENDIX "A"

LOCATION MAP
&
GENERAL GEOLOGY
PERK GROUP


Post Office
Kleena Kleene
Bella Coola 130 km
One Eye Lake
road to Tatla Lake & Williams Lake
Williams Lake 224 km
road to Mine
Miner Lake
Valley Fill
Perks Peak
6250'
CLAIM OUTLINE
APPROX.
LEGEND
I3 Andesite basalt and minor sediments
I2 Shale siltstone, quartzite, sandstone greywacke conglomerate
B Coast Plutonic Rock
Fault Zone
Geological Boundary (defined, approximate, assumed)
Limit of geological mapping
Area covered by VLF-EM ground survey (see Appendix B for anomalies)
Contour line (in feet)
After: H.W. Tipper
G.S.C. Paper 68-33, map 5-1968
Mount Waddington map area.
APPENDIX A
PERK GROUP
92N14E
LOCATION MAP
&
GENERAL GEOLOGY
KILOMETERS
MILES
Gerhard von Rosen, P.Eng
November, 1987

APPENDIX "B"

REPORT

ON

AIRPHOTO STUDY

OF

AIRPHOTOS: 30BCC281/101&102

COVERING

PERK GROUP MINERAL PROPERTY

PERKINS PEAK AREA

BY

Douglas A. Chapman

GEAREX ENGINEERING mission bc

TO: GERHARD VON ROSEN, P.ENG.

DEAR SIR, AT YOUR REQUEST I HAVE COMPLETED A PHOTOSTUDY OF THE PERK GROUP OF CLAIMS. THESE CLAIMS ARE LOCATED IN THE PERKINS PEAK AREA, EAST OF THE HEADWATERS OF CALWELL CREEK AND WEST OF THE KLINAKLINI RIVER (92N/14E) IN THE CARIBOO MINING DIVISION, BRITISH COLUMBIA.
THE BC GOVERNMENT COLOR AIRPHOTO COVERING THIS AREA IS 30/BCC/281/101. THE PHOTOSTUDY ENTAILS THE ANNOTATING OF APPARENT FAULT AND/OR FRACTURES SYSTEMS AND THE COMPILING OF THIS INFORMATION INTO EMPIRIC FORM THAT RELATES TO THE RELIEF OF STRESS IN THE CRUSTAL SURFACE BY FAULTING.
SHEETS 1 TO 4 INDICATE THE DATA AS OBSERVED, A FIFTH OVERLAY INDICATES THE PROBABLE TENSION/SHEAR FAULTS AS INTERPRETED FROM THE DATA.

LOGIC OF SURVEY

THE ISOSTATIC TRACES OF APPARENT FAULT AND/OR FRACTURE JOINT SYSTEMS IN THE EARTH'S CRUST ARE THE RESULT OF THE VARIANCE OF HORIZONTAL STRESSES ACTING ACROSS THE EARTH'S BOUNDARY SURFACE REPRESENTED BY THE PLANE OF THE AERIAL PHOTOGRAPH.
THE MORE VISIBLE AND DENSE THE PATTERN, THE GREATER THE VERTICAL PRESSURE OF THE UNLOADING FORCE ACTING AT THE BOUNDARY RESULTING IN INCREASED SURFACE TENSION.

continued:

LOGIC OF SURVEY

MOST OREBODIES ARE HOSTED BY ROCK STRUCTURES INDUCED IN THE ROCK AS A RESULT OF DEFORMATION; EITHER AS STRESS AND/OR STRAIN ENVELOPES WITH FRACTURE FLOODING BY MINERALIZERS, OR SHEAR TENSION FISSURES ASCENDED BY VEIN MATERIAL.

METHOD OF SURVEY

THE JOINT PATTERNS AS ISOSTATIC TRACES ARE ANNOTATED TO EITHER THE PHOTOGRAPH OR AN OVERLAY AND ARE THEN ORGANIZED INTO AN EMPIRIC FORM BY ESTIMATING THE COUNT OF TRACES INTERSECTING THE PERIMETER OF EACH SAMPLE AREA TAKEN. SEE SHEET 1 & 2.

THE INITIAL ESTIMATE OF FRACTURES PER UNIT AREA IS AVERAGED FOR THE MEAN VALUE OF FOUR SAMPLE AREAS AROUND A CENTRAL POINT, THIS RESULTING VALUE FOR THE INTERPOLATED MIDPOINT IS THEN CONTOURED ALONG EQUAL VALUES TO DISPLAY AN ISOGRADIENT OF THE MAXIMA/MINIMA RELATIVE DENSITY. SEE SHEET 4

A FOURTH OVERLAY INDICATES THE PROBABLE TENSION/SHEAR FAULTS AS INTERPRETED FROM THE DATA.

RECOMMENDATIONS

1) PROSPECTING TRAVERSES SHOULD BE ALONG THE PREFERRED SHEAR ZONES. THESE DEEPSEATED FAULTS OFFER THE MOST LIKELY ZONES WHERE MINERALIZATION WILL OCCUR.

a) GEOLOGICAL PROSPECTING SHOULD BE SUPPORTED WITH ROCK GEOCHEMISTRY.

b) A VLF-EM UNIT SHOULD BE USED AT INTERVALS ACROSS THE STRIKE IN CONJUNCTION WITH SOIL GEOCHEMISTRY IN AREAS WHERE OVERBURDEN EXISTS.

2) FURTHER AIRBORNE WORK OF THE CLAIM AREA USING LOW LEVEL MAGNETOMETER, VLF-EM GEOPHYSICAL SURVEYS WOULD PROVIDE VALUABLE DATA AT REASONABLE COST.

Respectfully submitted,

D.A. Chapman

APPENDIX "C"

SHEETS 1-2-3-4-4

DATA DISPLAY

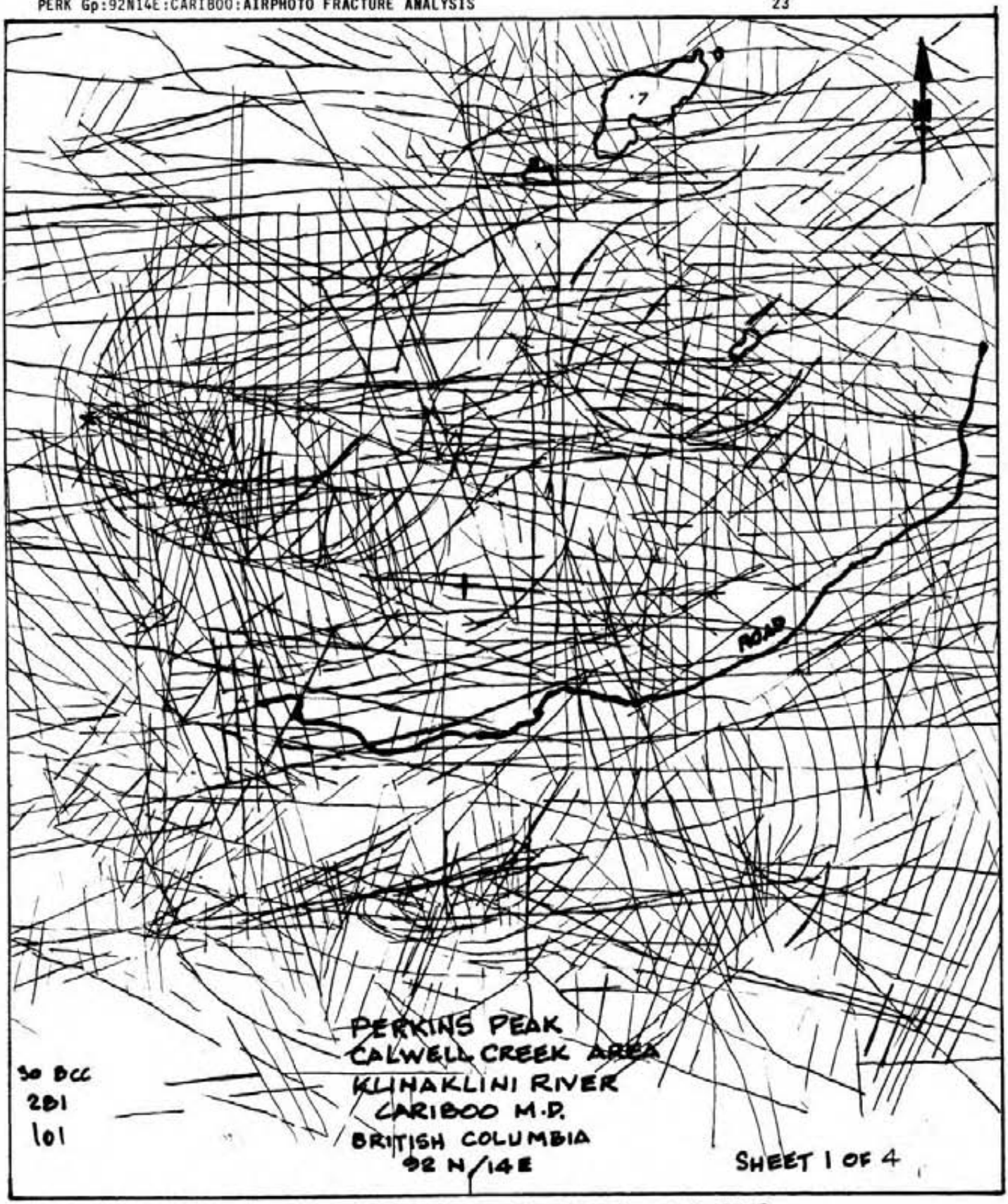
SHEET 1: ANNOTATED ISOSTATIC TRACES

SHEET 2: UNIT AREA SAMPLES OF ISOSTATIC TRACES

SHEET 3: RELATIVE DENSITY ESTIMATE

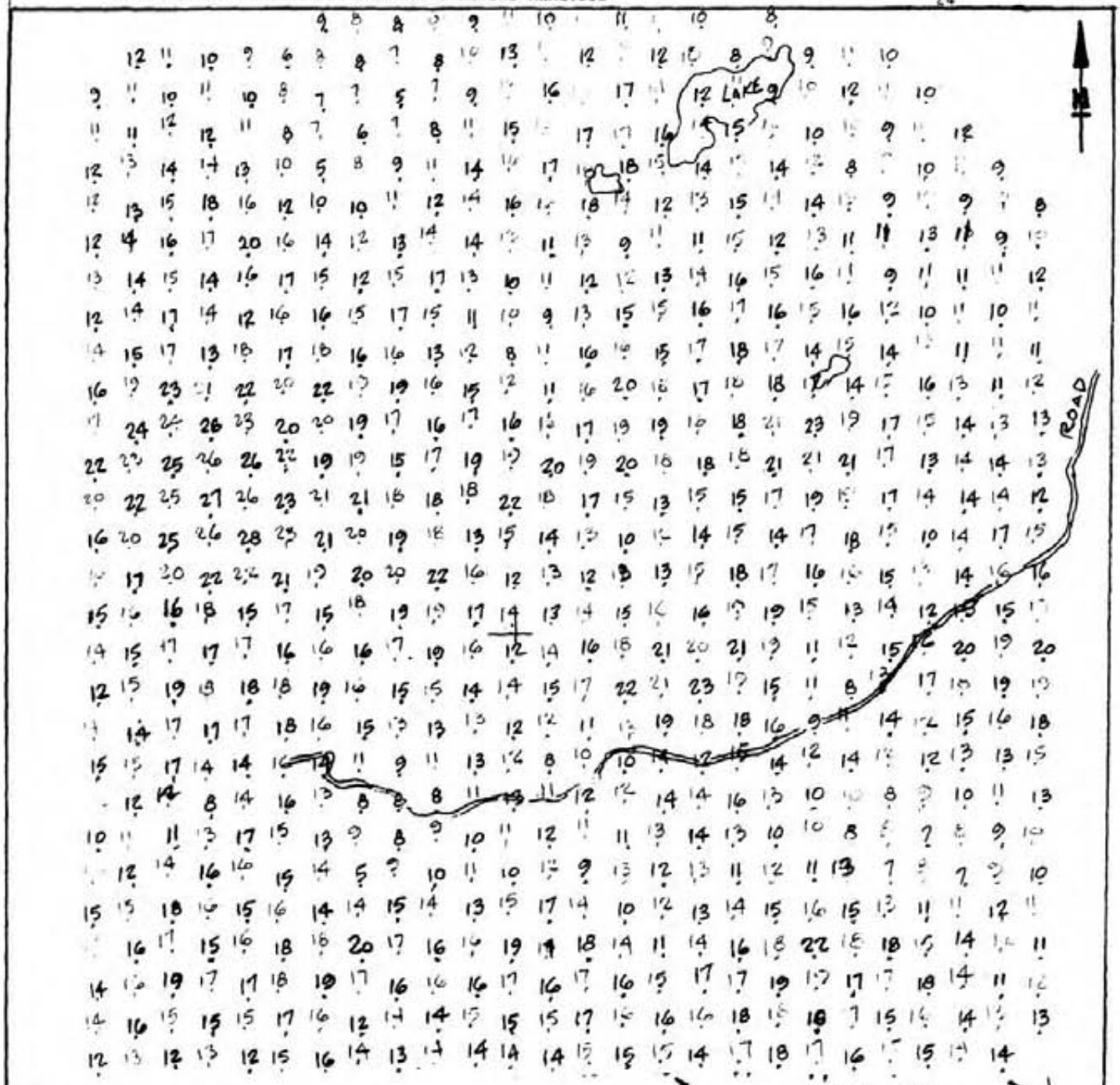
SHEET 4: RELATIVE DENSITY ISOGRADIENT

OVERLAY SHEET 4: INDICATED SHEAR TENSION FAULT ZONES



ANNOTATED ISOSTATIC TRACES FROM VISIBLE FRACTURE/FAULT PATTERNS OBSERVED

AEROPHOTO INTERPRETATION COMPILED BY D.A.CHAPMAN OCT. 1983



30 BCC 281-101

AIR PHOTO NUMBER
COLOUR 1:15,840

PERKINS PEAK
CALWELL CREEK AREA
KLINAKLINI RIVER
CARIBOO M.D.
BRITISH COLUMBIA
92 N/14E

UNIT AREA SAMPLE CENTRES (ESTIMATED LINEAL ISOSTATIC TRACE VISIBLE IN AIRPHOTO)

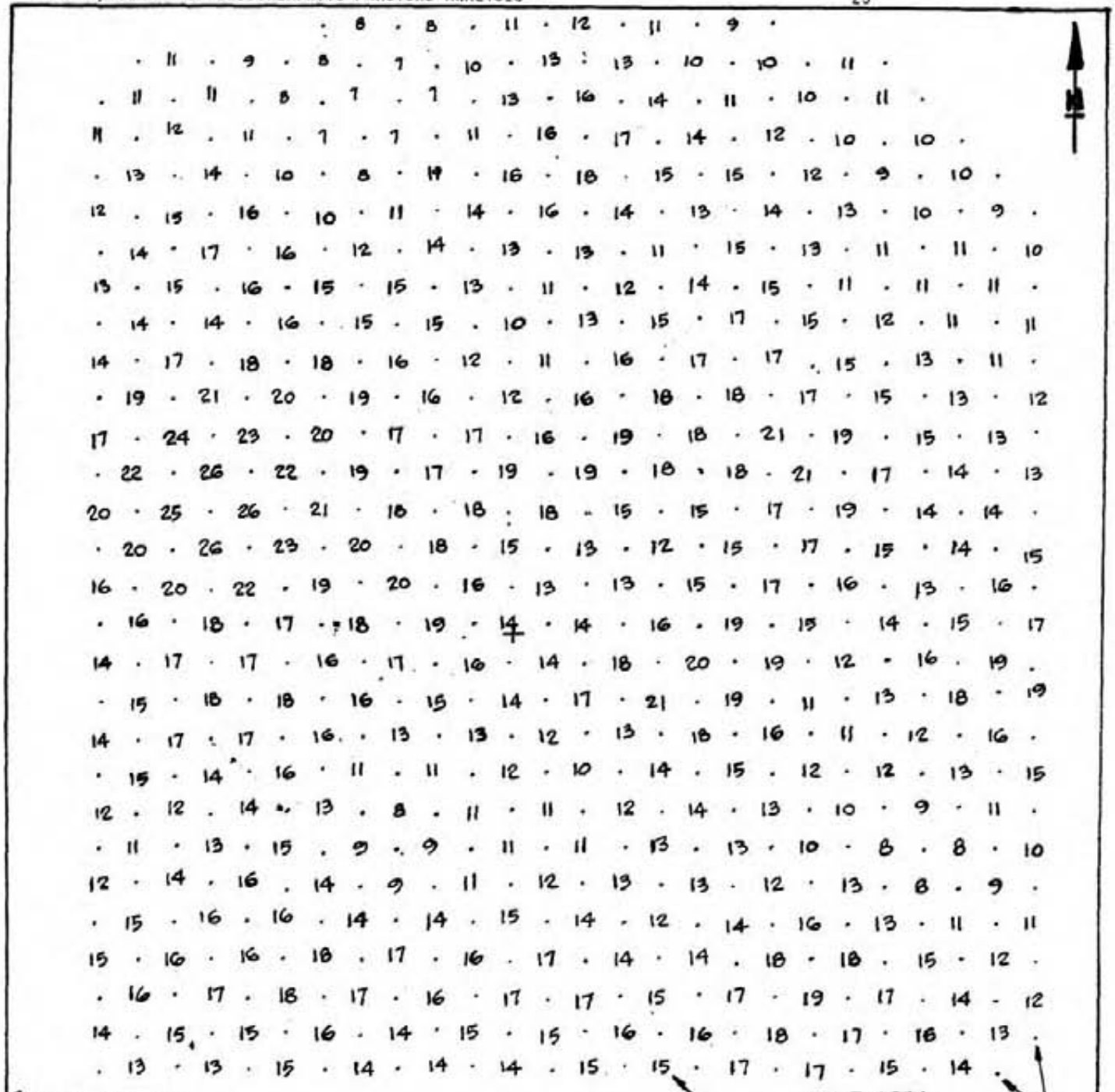
INTERPOLATED MEAN VALUE OBSERVED WITHIN THE SAMPLE AREA

SHEET 2 OF 4

UNIT AREA SAMPLES OF ISOSTATIC TRACES

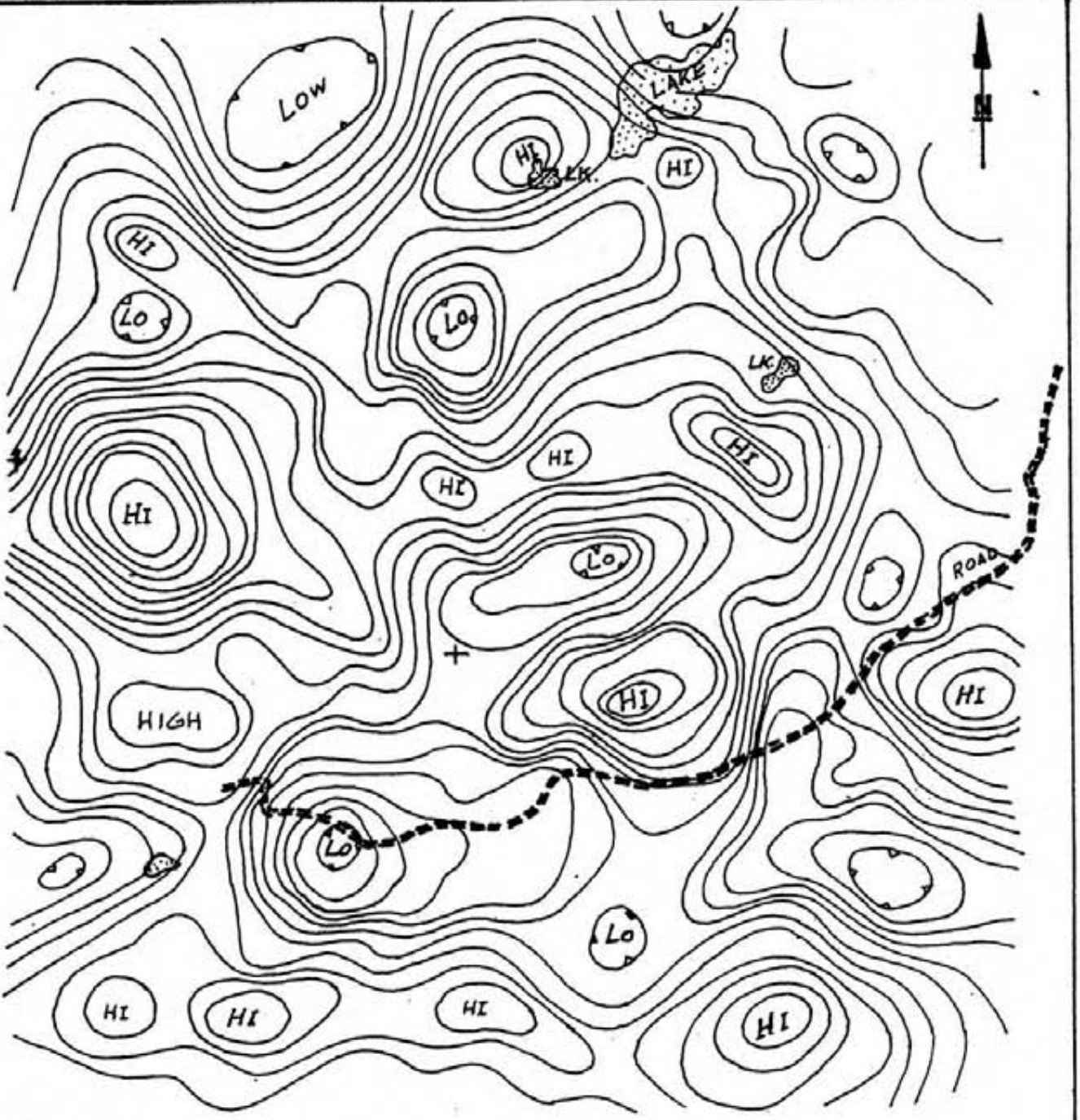
AERO PHOTO INTERPRETATION COMPILED BY D.A. CHAPMAN OCT 1983

GEAREX ENGINEERING mission bc



RELATIVE DENSITY ESTIMATE OF VISIBLE FRACTURE/FAULT PATTERNS OBSERVED.

AERO PHOTO INTERPRETATION COMPILED BY D.A. CHAPMAN OCT 1983



30 BCC 281-101
AIR PHOTO NUMBER
COLOUR 1:15,840

PERKINS PEAK
CALWELL CREEK AREA
KLINAKLINI RIVER
CARIBOO M.D.
BRITISH COLUMBIA
92 N/14E

SHEET 4 OF 4

RELATIVE DENSITY ISOGRADIENT OF VISIBLE FRACTURE/FAULT PATTERNS OBSERVED

AEROPHOTO INTERPRETATION COMPILED BY D.A. CHAPMAN OCT. 1983

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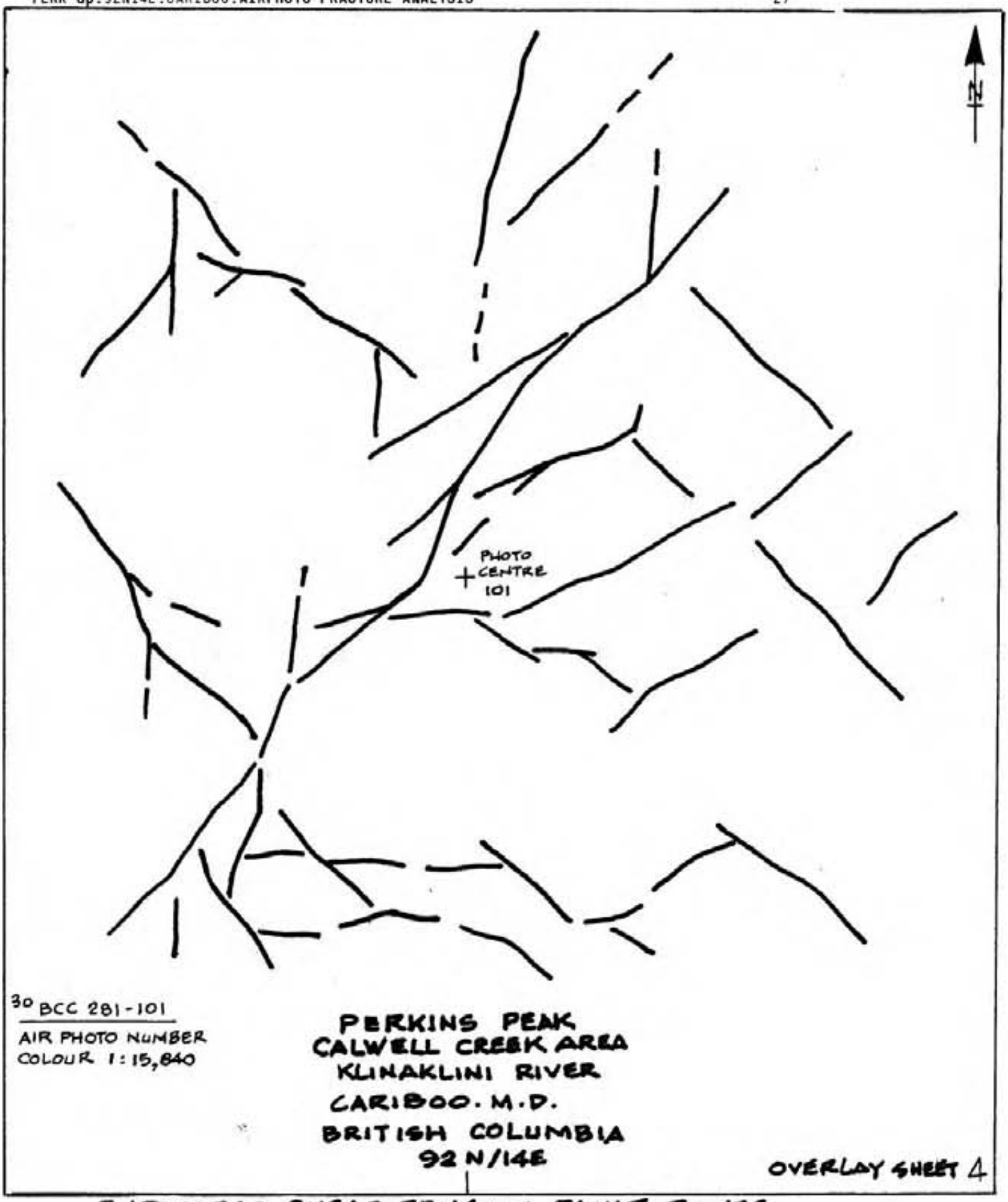

30 BCC 281-101
AIR PHOTO NUMBER
COLOUR 1:15,840

PERKINS PEAK
CALWELL CREEK AREA
KLINAKLINI RIVER
CARIBOO. M.D.
BRITISH COLUMBIA
92 N/14E

OVERLAY SHEET 4

INDICATED SHEAR TENSION FAULT ZONES

D. A. CHAPMAN OCT. 1983

GEAREX ENGINEERING mission bc

APPENDIX "D"

CERTIFICATION

D.A. CHAPMAN

GERHARD VON ROSEN

CERTIFICATION

1. I Douglas A. Chapman, certify that I have practised the art of photogeological interpretation for mineral exploration for more than 15 years.

2. I received a Technical Diploma in 1949 from the Vancouver Technical School.

3. From 1950 to 1955 I was engaged in mapping and surveys using both ground and airborne methods; first, with the Canadian Government and, secondly, with Photographic Surveys (Western) Ltd. in Vancouver.

4. From 1955 to 1959 I was engaged by Blanchet and Associates Ltd. in Calgary, Alberta, where I practised interpretation and compilation of fracture patterns for structural studies; studies related to oil exploration.

5. From 1961 to 1964 I was engaged by Chapman, Wood and Griswold Ltd. and assisted Mr. Blanchet in the formation of their air photo department as well as carrying out studies relating to tectonics and their association to mineral deposits.

6. In 1965 I formed D.A. Chapman & Associates Ltd. to provide air photo interpretation for mining exploration and, primarily, exploration reports to assist consulting engineers in planning field programmes.

7. In 1978 I formed J.C. Explorations to provide similar services as D.A. Chapman & Associates Ltd.

Signed this 20 day of OCTOBER, A.D. 1983

D.A. Chapman

CERTIFICATE OF QUALIFICATIONS

I, Gerhard von Rosen, reside at Mission British Columbia, at 33176 Richards Ave.

I have been practicing my profession of consulting geologist6 since my graduation from the University of British Columbia in 1962 with a B.Sc., and in 1966 with an M.Sc. degree in Honours Geology.

I have been involved with this kind of survey several times before, and I am qualified to compile and interpret this information.

Respectfully submitted,

Gerhard von Rosen, M.Sc., P.Eng.

February 6, 1984

ITEMIZED COST STATEMENT

Airphoto Fracture Density Analysis: D.A. Chapman	$2000
Assessment Report: Summary	$1350
Report Preparation	$250
TOTAL COSTS	$3600

AREA COVERED

Total area of survey: one airphoto (1:15,840-1:25,000)	1225 ha
Area covered by Perk Group	700 ha