840834

REPORT ON

ALBERT RIVER TUNGSTEN PROPERTY

ALBERT RIVER 82J/12E

GOLDEN MINING DIVISION

LAT 50°38'N - LONG 115°35'W

FOR

DIA MET MINERALS LTD.

KELOWNA, B.C.

BY

C.E. FIPKE

C.F. MINERAL RESEARCH LTD.

1677 Powick Road

Kelowna, B.C.

September, 1985

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Introduction

Geological mapping and prospecting, line cutting, ground magnetometer geophysics, I.P. and resistivity geophysics, conodont sampling and heavy mineral geochemical sampling were completed on the W - Group claims during the summer of 1984, subsequent to July 11th, 1984. The W - Group claims consist of six contiguous claims totalling 80 units. The claims are 100% owned by Dia Met Minerals Ltd. C.E. Fipke of C.F. Mineral Research Limited was contracted as operator to complete the assessment work.

Location, Access, Topography

The DINGBAT, DURB, BARBI, ASH, CHESTER and ZIRKON claims are all located Latitude 50°38'N, Longitude 115°35'W; NTS 82J/12E in the Golden Mining Division, approximately 75 kilometres east of Radium B.C. The claims lie near the west headwaters of Albert River between Tangle Peak and Albert River (figure 1).

The claims are accessible by car on 40 kilometres of good logging access road leaving the east side of Sinclair Canyon Highway #93 at a point 4 kilometres north of Swede Creek. The logging road system leads southeasterly, crossing the Kootenay River at Yearling Creek, to Palliser River, a distance of about 20 kilometres. The road leads easterly about 8 kilometres to the Albert River and then northerly along the river 12 kilometres to the Albert River tungsten property.

There is also a poorly maintained logging road that branches up Cochran Creek about 4 kilometres south of where the main logging road crosses the Kootenay River. Difficult four wheel drive access is possible for 11 kilometres up Cochran Creek to a point about 2 kilometres west of the Zirkon claim. The said point is about 29 kilometres from Highway #93 and about 15 kilometres from hydro power lines.

The east side of the claim block is on the west side of Albert River at an elevation of 1300 metres and rises steeply to the west to over 2600 metres. The central portion of the property is difficult to traverse because of steep topography and dense bush. For this reason, the work was helicopter supported.

METHODS

1) Geology

Most of the geological field mapping was completed by geologist, C.E. Fipke using aerial photographs. Dr. S.L. Blusson completed some geological work and prospecting towards the initial part of the project, but his findings were unavailable at the time of writing this report. Geologist, R. Capell drafted C.E. Fipke's field notes and air photo interpretations onto topographical maps, figure 2 . Day prospecting and some U.V. lamp prospecting at night was completed by geologist, C. Fipke and geological technicians, B. Carr and P. Derkson.

2) Line Cutting and Geophysics

The lines cut, illustrated in figure 3 , were completed by Paul Derkson, Mike Finney, Brent Carr and Brad Cook using chain saws and axes.

The geophysical methods used are summarized in the geophysical report by geophysicist, Phil Nielsen (Appendix A).

3) Conodont and Heavy Mineral Sampling

Four $\pm$ 2 kg. rock samples were collected at the sites illustrated in figure 4 by geologist, C. Fipke. These were dissolved in dilute formic or acetic acid at the C.F. Mineral Research laboratory in Kelowna, B.C. The -20 +200 mesh portions were boiled in Quaternary 0 solution and submitted to T.B.E. heavy liquid separations. Technicians microscopically extracted any conodonts present in the resultant heavy residues. Geologist, C.E. Fipke microscopically examined potential conodonts extracted by the laboratory technicians.

The heavy mineral concentrate samples were collected by geological field technician, B. Carr and geologist, C. Fipke at locals illustrated on figures 3 and 4 . Field collection was accomplished by wet screening about 8 kgs. of -20 mesh and hand panning the 8 kg. samples to about 1 cup volumetric size. The hand panned concentrates were, in some instances, U.V. lamp tested for scheelite in the field. Each of the cup sized pan concentrates were then lab dried and heavy liquid separated with full strength tetra-bromoethane and methylene iodide at the C.F. Mineral Research laboratory in Kelowna. The resultant heavy fractions were subsequently electromagnetically separated into magnetic, paramagnetic and non-magnetic fractions.

The -20 mesh heavy non-magnetic portions of small concentrates or the -20 +60 mesh and -60 mesh heavy non-magnetic portions of large concentrates were then U.V. lamp tested for scheelite. Some of these were examined by geologist, C. Fipke using a binocular microscope. The -20 mesh heavy non-magnetic concentrates were then hand crushed to -60 mesh using an agate mortar and pestle. The crushed samples and uncrushed -60 heavy non-magnetic samples were then tare weighed into vials and submitted to N.A.S. laboratories in Hamilton, Ontario for W - Au - As geochemical analysis using the delayed neutron activation method. After the resultant radioactive samples were cooled to low levels, the sample vials were sent to Barringer laboratories in Calgary, Alberta for Cu - Pb - Zn - Mo - Ag geochemical analysis by atomic absorption and Sn geochemical analysis by a specific method.

RESULTS

1) Geology

The field mapping results are compiled on the gological map (figure 2) and cross section (figure 2). The current results indicate that three sections of Middle Cambrian Chancellor Group marine sedimentary rocks outcrop on the claims. The basal section (Chcp) consists of a sequence of light and dark thin and medium-bedded argillaceous limestone with local beds of calcareous argillite containing round limestone nodules. The basal section is conformably overlain by a locally non or weakly calcareous grey shale or locally sericitic pelitic phyllite (Chpp). The grey shale section appears conformably overlain by a commonly cream colored thick-bedded to massive limestone (Chml).

A (1 to 20 metres thick) pyritic sileous aphanitic sill unit(s) conformably intrudes the basal marine carbonate and argillite unit in two locals (figure 4).

The marine sedimentary and sill units are tightly isoclinically folded about gently plunging to subhorizontal NNW or SSE trending fold axis with NNW trending and steeply (50 - 80°) west dipping axial planes.

The pelitic phyllite unit is intensely spotted hornfelsed at the south and east edges of the small lake in the southeast parts of the claims. The heavy mineral concentrates from this local contain abundant medium green diopside and andalusite. Traces to minor quantities of medium green diopside and andalusite are also observed in heavy mineral concentrates at sites collected downstream from the magnetic geophysical high anomaly over the basal argillaceous limestone unit. Dr. S.L. Blusson, who completed his Ph.D. thesis on the Geology of the Can Tung Area, Yukon, states that such minerals occur outward from skarn areas in proximity to intrusives.

The basal argillaceous limestone and sill units contain local zones of abundant quartz-carbonate veins and dykes that range to about 1 to 2 metres thick. Such veins are rare or absent up and down strike in the same Chancellor host stratigraphy. The veins and dykes are, for the most part, confined to the axial plane cleavages of folds that occur in all the Chancellor marine sedimentary units and sills. In a few cases quartz lenses conformably follow thin beds of minor folds. In some of these cases the folded quartz lenses thicken adjacent quartz carbonate veins infilling axial plane cleavages. In other cases quartz carbonate veins and dykes crosscut the axial plane cleavage suggesting the veins were emplaced at some time after the formation of the axial plane cleavage. Locally veins and dykes contain minor amounts of epidote and pyrite with chlorite alteration envelopes or pyrite and chalcopyrite with muscovite sericite alteration envelopes. In some minor cases the quartz carbonate veins contain minor amounts of galena or sphalerite. Moderate amounts of fine scheelite were located in a marble dyke talus block via U.V. lamp night prospecting directly downslope from the highest ground magnetic area (figure 4) in the central portion of the claims.

2) Line Cutting and Geophysics

The lines cut for ground geophysical purposes are diagramatically illustrated on figures 3 and 5.

The results of the ground geophysical survey are given by geophysicist, Phil Nielsen as Appendix A. These indicate a broad weak magnetic anomaly flanked by two stronger magnetic anomalies occurring in the central claims area (figure 5). The strong southeast parts of the magnetic zone were also detected on a 1981 airborne magnetometer survey of the area. Mr. Nielsen interprets that the weak magnetic area could be related to a buried intrusion flanked by two stronger magnetic highs that could be related to subvertical near surface pyrrhotite (magnetic skarn).

Stan Emerson, magnetometer operator, reports that the ground magnetic survey traversed sill in at least four locals. The sill areas were found to be non-magnetic with weak slight magnetic lows just before the sills were traversed.

The profiles for the I.P-resistivity survey are given as figure 6 and 7 . These illustrate that despite problems with conductive noise (i.e. locally pyritic argillites) and animals continually breaking infinity cables, some information was obtained along the ENE trending base line between 1200 metres and 2300 metres (figure 6) as well as along a SSE trending crossline that cuts the baseline at 2070 metres east. Some potentially anomalous resistivity low values and some I.P. (Ma) high values occur along the baseline between 1200 metres and 1400 metres east and between 1800 metres and 2200 metres east as well as along the crossline at 200 metres south. The latter two potentially anomalous zones occur adjacent to the two ground magnetic highs that are suggested by Mr. Nielsen to be caused by pyrrhotite.

3) Conodont and Heavy Mineral Sampling

No conodont microfossils were observed in any of the samples. However, the heavy mineral acidized residues from conodont samples 2 and 3, collected in the area near the highest magnetic results (figure 4), were found to have abundant quantities of sericite, crystalline, chlorite and traces to minor quantities of andalusite. The crystalline chlorite is intergrown in vughs with pyrite as light green transparent crystals seemingly pseudomorphous after pyroxene (diopside?). S.E.M. analysis of the pseudomorphous grains indicate the chlorite to be 100% composed of Mg - Al - Si. Conodont sample 4, collected from the grey shale unit near the magnetic anomaly, also contained abundant quantities of sericite and minor quantities of andalusite. Only trace to minor quantities of sericite were found to occur in the heavy fraction of conodont 1, collected outward from the magnetic high zone. The said mineralogies are alteration minerals that would be expected to be related to a distant rather than near surface intrusion.

The heavy non-magnetic concentrate W - Au - As - Cu - Pb - Zn - Mo - Sn geochemical results are plotted as figures 9 to 24. Estimated regional geochemical threshold values of analogous -60 mesh heavy non-magnetic concentrate results from vicinity streams draining Paleozoic carbonate areas east of the Rocky Mountain Trench are also recorded on the maps. The U.V. lamp scheelite grain count results are given as figures 25 and 26.

The results demonstrate that the central claims area centered about the magnetic high are intensely anomalous in W, moderately anomalous in Cu, with some weak spot highs in Au and Pb. The areas surrounding the central magnetic area in a seemingly zonal manner are moderately to strongly anomalous in Cu and Pb; moderately anomalous in Au, As and Zn; and weak to moderately anomalous in Mo.

Even more intense W anomalies with moderate Cu and some weak spot highs in Au, Pb and Zn were obtained in an area centered on both sides of the ridge about one kilometre due north of the ground magnetic high area. In fact, an airborne magnetic high was obtained in the drainage area of intensely W anomalous heavy mineral sample sites M11, W223 and W228. Moderate to strongly anomalous Au values and some weakly anomalous Zn values appear to zonally surround this area.

Sample site B197, situated about 500 metres south east of the ground magnetic area in the central claims area, directly drains a thickened sill area and is only weakly anomalous in W. Site J45, just south of the ground magnetic area, is moderately anomalous in W downstream from a sill but here the W appears to originate from the area of site B196 upstream from the sill.

Strong Cu - Pb - Zn with relatively weak W and Au anomalies also occur in spotty areas in the major drainage that drains the lake in the southern portions of the claims.

CONCLUSIONS and RECOMMENDATIONS

The geophysical results of P. Nielsen's report indicate that a 550 metre diameter buried intrusion flanked by subvertical pyrrhotite rather than the (non-magnetic) sill units probably cause the magnetic anomalies in the central area of intensely anomalous W (scheelite) mineralization.

This contention is supported geologically in that trace to moderate amounts of chlorite, sericite and medium green diopside and andalusite, minerals that typically occur outward from scheelite bearing pyrrhotite skarns, occur either as outcrop minerals within or directly downslope from the central magnetic high. Scheelite bearing marble dyke rock, but no sill rocks, has been found directly downslope from the central magnetic high area.

Furthermore, only trace to minor amounts of scheelite are derived from the sill outcrop areas south and southeast of the magnetic high zone.

The distribution of scheelite (W) mineralization on the claims instead correlates with areas of strong quartz-carbonate veining and dyking which crosscut both the lower argillite-limestone unit as well as the sill units on axial plane cleavages. Locally the veining and dyking crosscuts the axial plane cleavage of folds; is mineralized with minor chalcopyrite, galena, sphalerite and scheelite; and contains alteration envelopes of strong sericite and chlorite with pyrite and epidote. These features suggest the veins and dykes are related to an (intrusive) event later than the (Larimide) event causing the isoclinal folding of the sedimentary and sill units.

The moderate to intense W - Cu geochemical zonation coincident with the central magnetic high area surrounded by moderate to strong Cu - Pb - Zn - Au - As and weak Mo heavy mineral geochemistry also supports the geophysical and geological evidence for a buried intrusive source of strong scheelite mineralization.

The major tungsten deposits of the North American Cordillera such as Mac Tung, Can Tung and Climanx as well as the Albert River Tungsten property are situated in a geological setting at the eastern edge of instrusive activity. In fact, the favorable host rock geology of calceous argillites and locally nodular limestones capped by phyllitic shales at Albert River is similar to the host rock setting at Can Tung.

As the findings indicate a productive probably W rich intrusive capula, (± 550 metres in diameter, compared to a ± 100 metre buried capula at Can Tung) to be intruding favorable argillaceous carbonate host, tungsten bearing skarn should occur at the contact. Therefore, diamond drilling the two magnetic high targets is recommended.

As even more intense heavy mineral geochemical results from 6 to 12% W, with some strong Au, values occur in the area 1 kilometre to the north, additional prospecting and geological mapping, concentrate sampling and ground magnetometer geophysics is also recommended for this strongly anomalous area which is accessible by a logging road. Pending favorable results, this area could be diamond drilled at the same time as the central claims area.

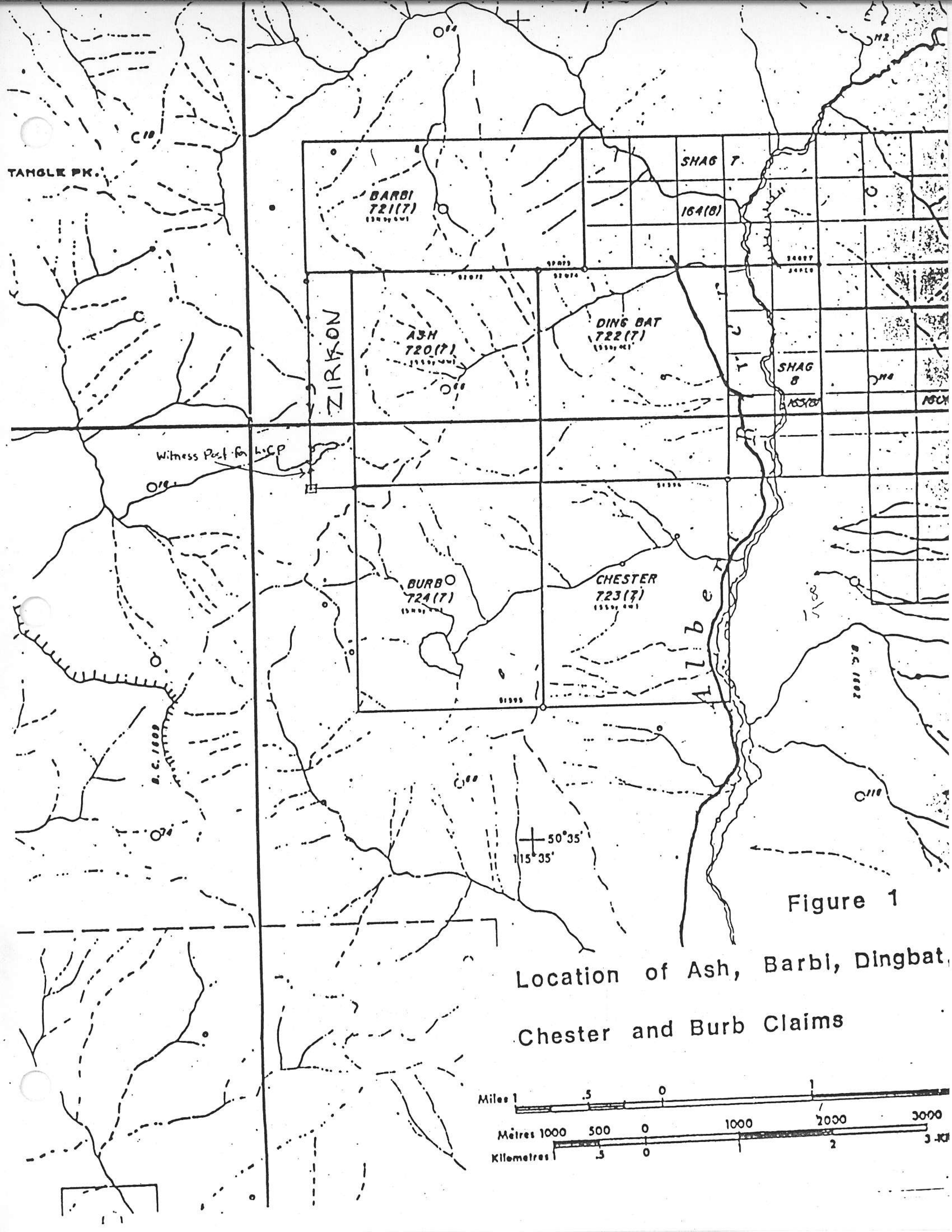
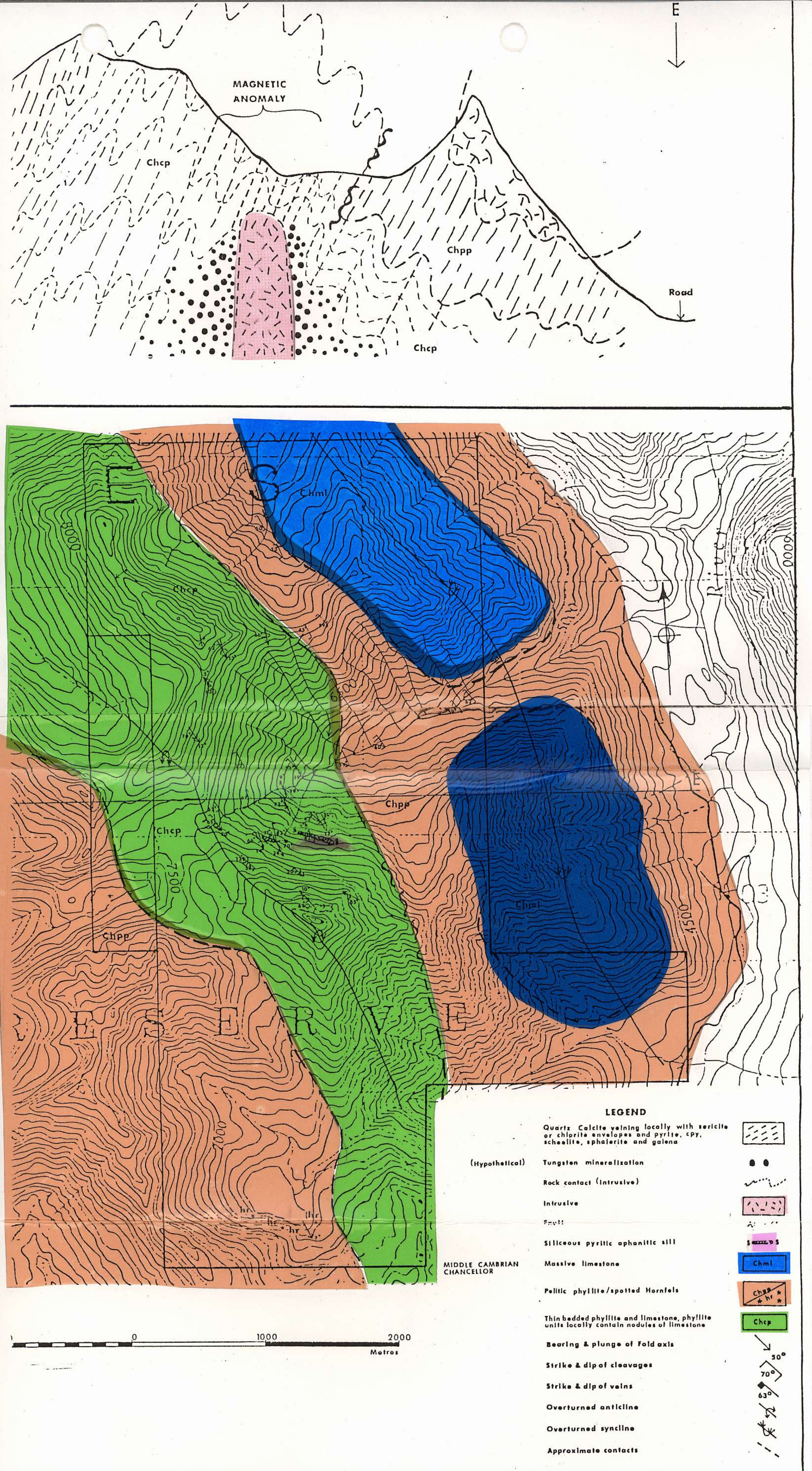


Figure 1

Location of Ash, Barbi, Dingbat, Chester and Burb Claims



ALBERT RIVER W-GROUP CLAIMS

DIA MET MINERALS LTD.

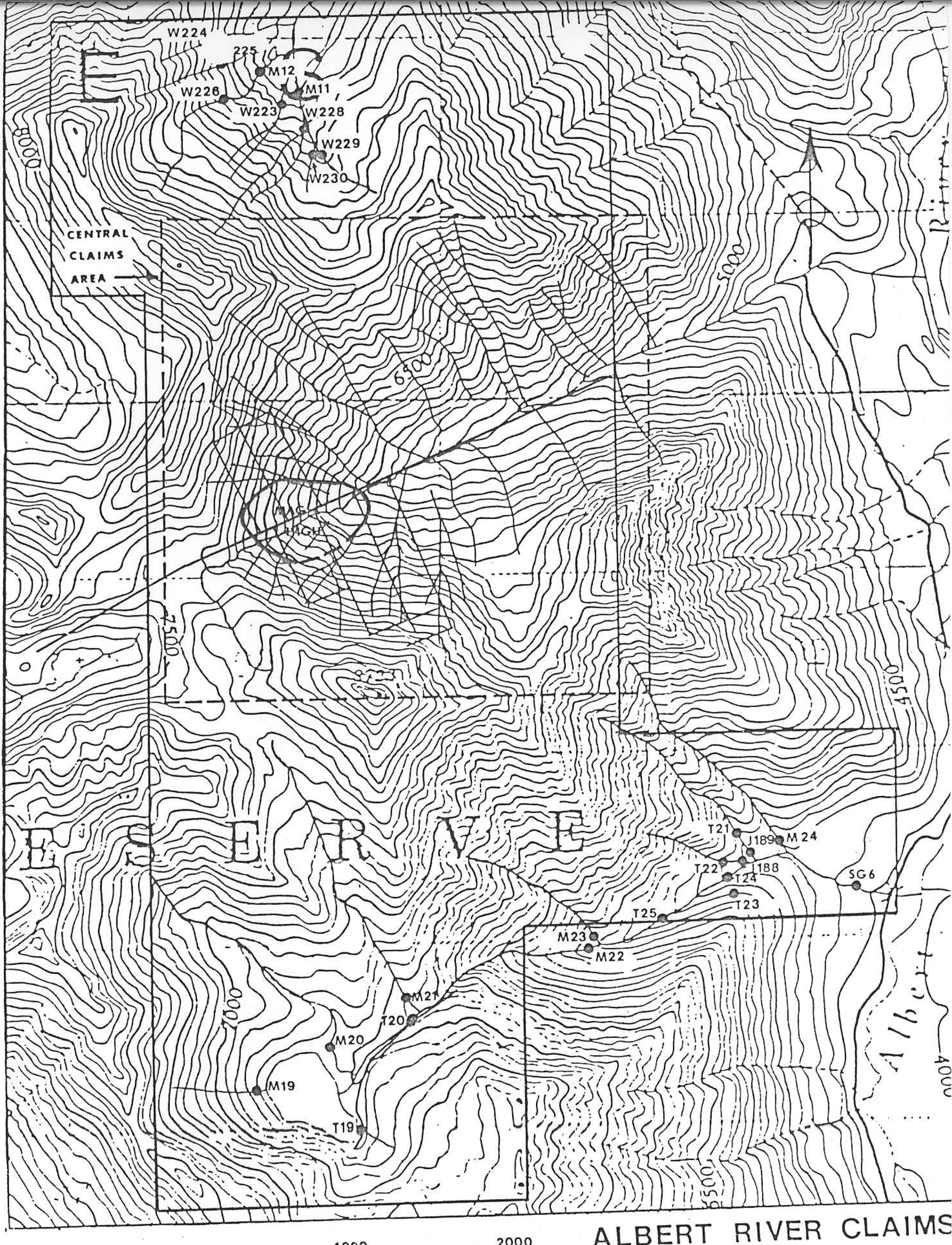
Geologic Map and

Interpretive W — E Section

C.F. MINERAL RESEARCH LTD.

C.E. Fipke Drawn: R.C.

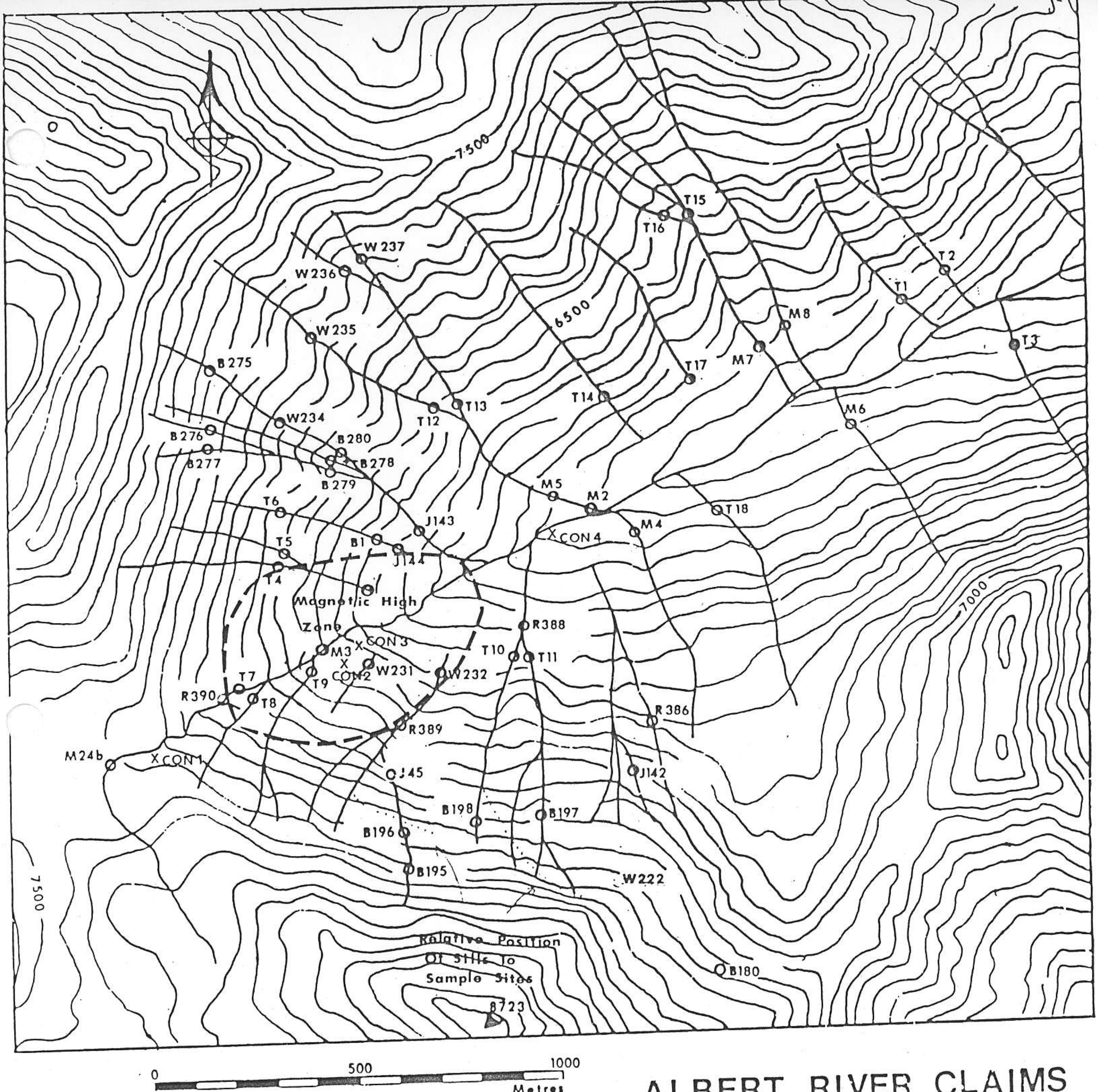
Figure 2



ALBERT RIVER CLAIMS

SAMPLE LOCATIONS & MAG. SURVEY LINES

FIGURE 3

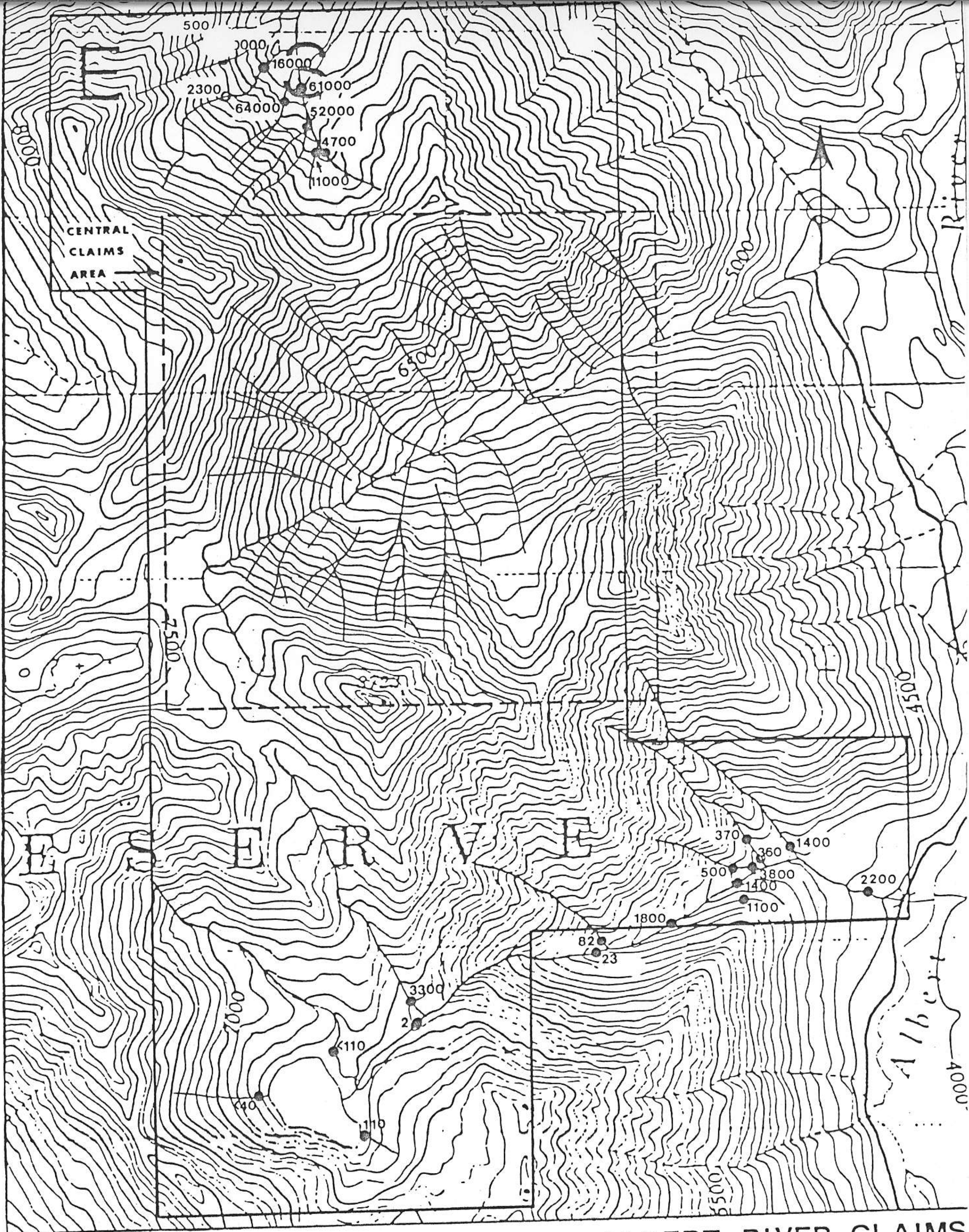


ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

SAMPLE LOCATIONS

FIGURE 4



ALBERT RIVER CLAIMS

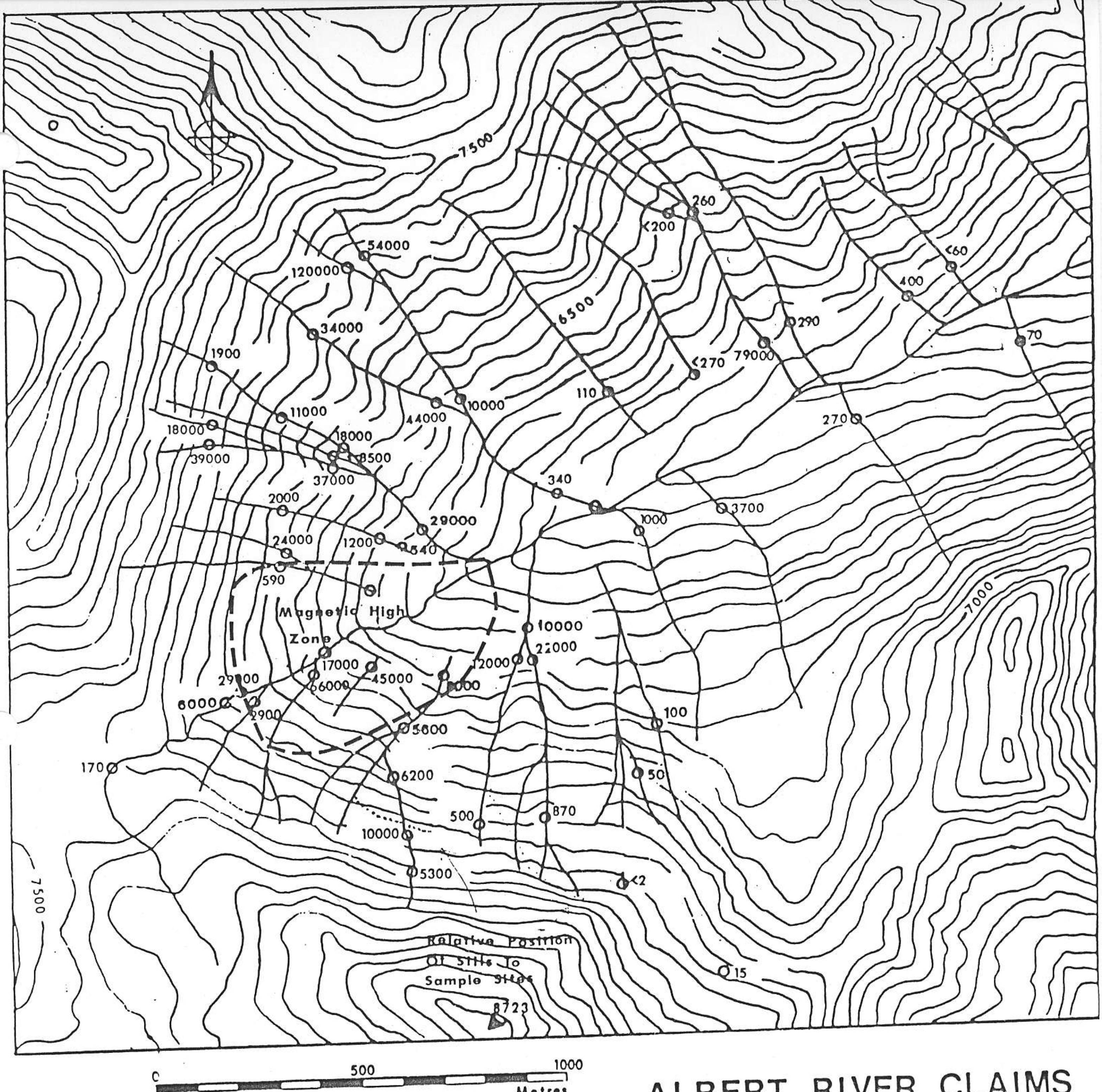
GEOCHEMICAL RESULTS : Tungste

LEGEND

● p.p.m. W

in Heavy Mineral Non Magnetic Concentrates

FIGURE 9



ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

GEOCHEMICAL RESULTS : Tungsten

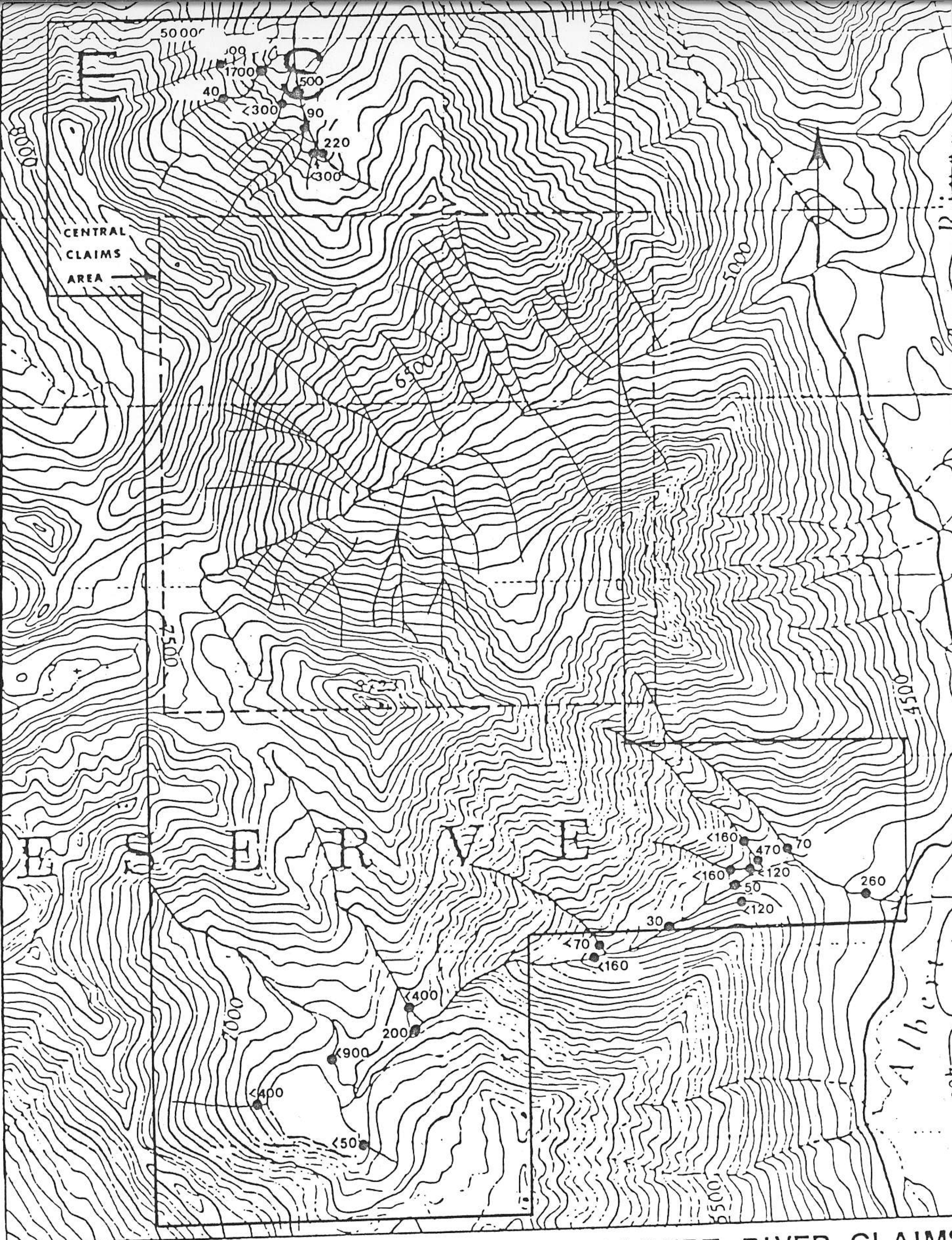
LEGEND

O p.p.m. W

in Heavy Mineral Non Magnetic Concentrates

Estimated Regional Threshold = 220 p.p.m. W
based on n = 610 results

FIGURE 10



0 1000 2000
Metres

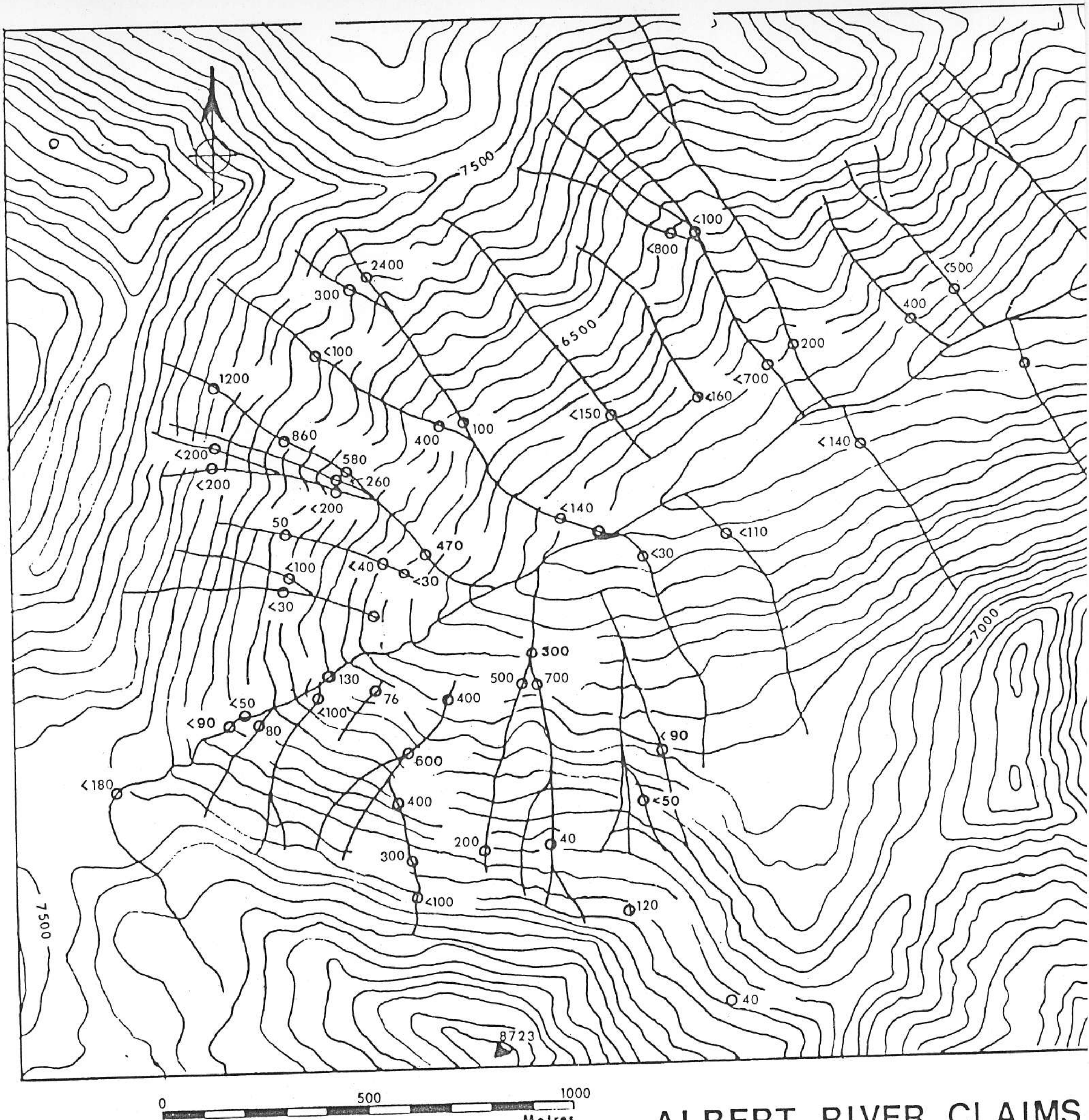
ALBERT RIVER CLAIMS

GEOCHEMICAL RESULTS: Gold

LEGEND

● p.p.b. Au
in Heavy Mineral Non Magnetic Concentrates

FIGURE 11



ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

GEOCHEMICAL RESULTS: Gold

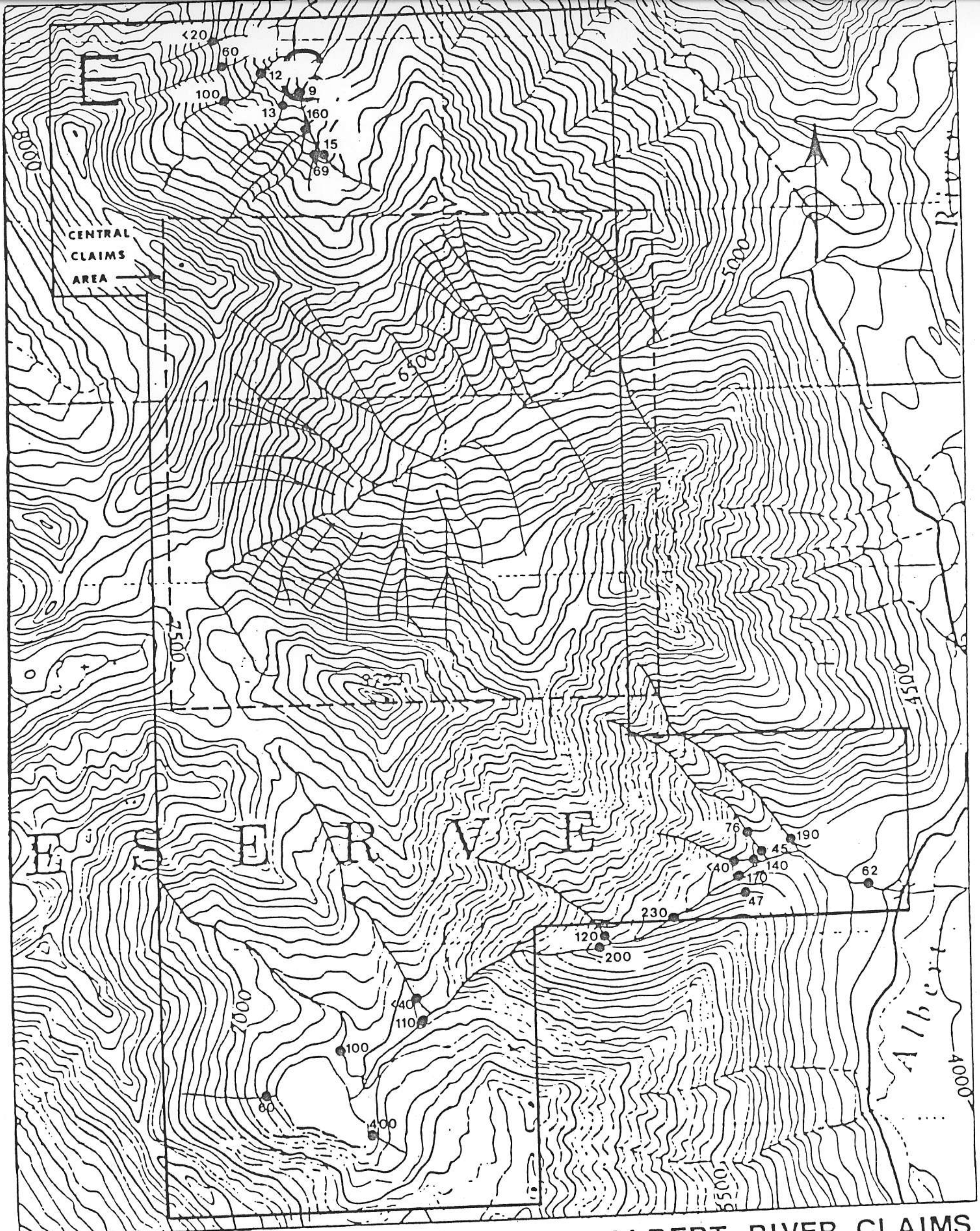
LEGEND

O p.p.b. Au

in Heavy Mineral Non Magnetic Concentrates

Estimated Regional Threshold = 30 p.p.b. Au
based on n = 554 results

FIGURE 12



ALBERT RIVER CLAIMS

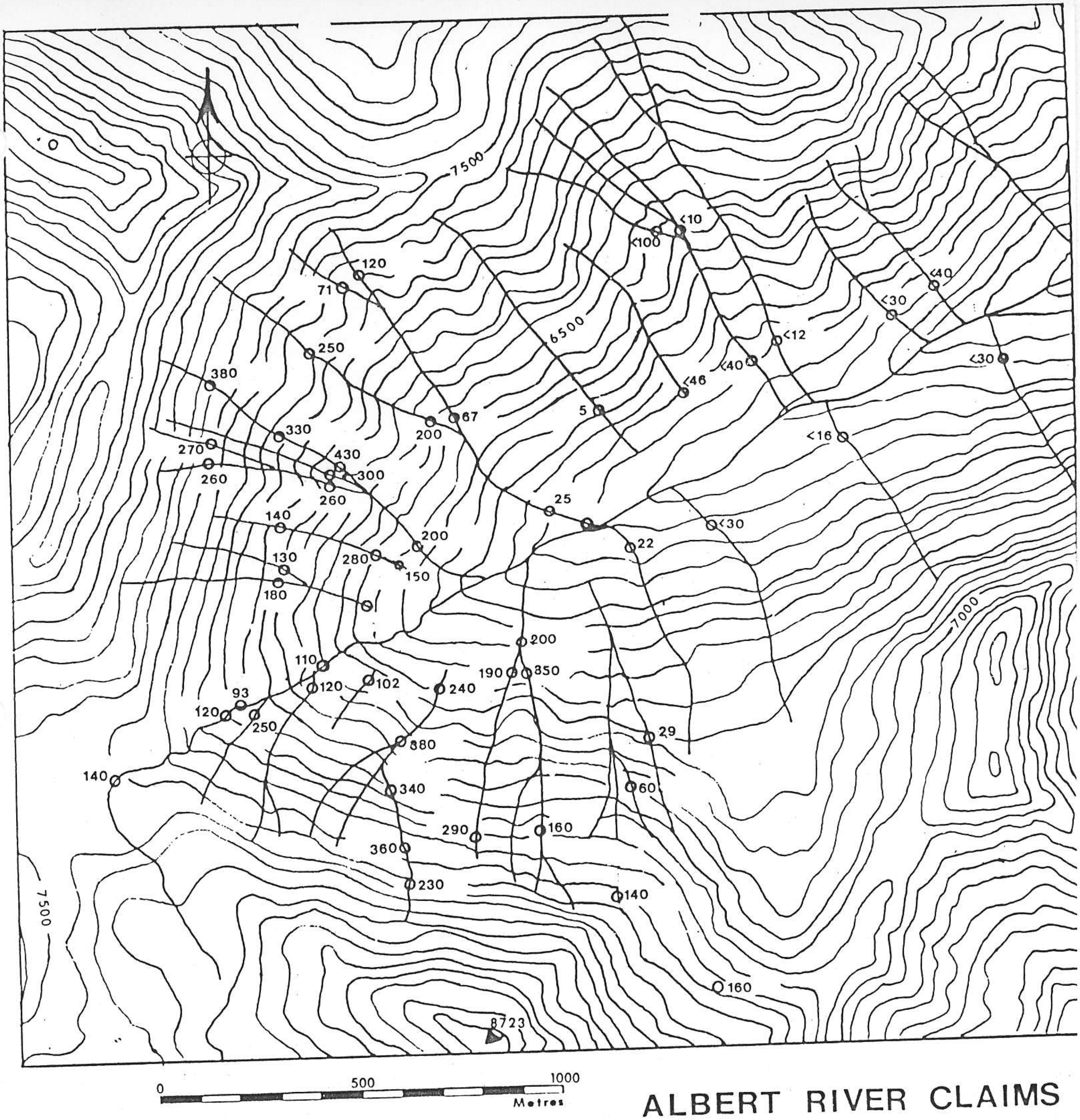
GEOCHEMICAL RESULTS : Arsenic

0 1000 2000
Metres

LEGEND

● p.p.m. As
in Heavy Mineral Non Magnetic Concentrates

FIGURE 13



ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

GEOCHEMICAL RESULTS : Arsenic

LEGEND

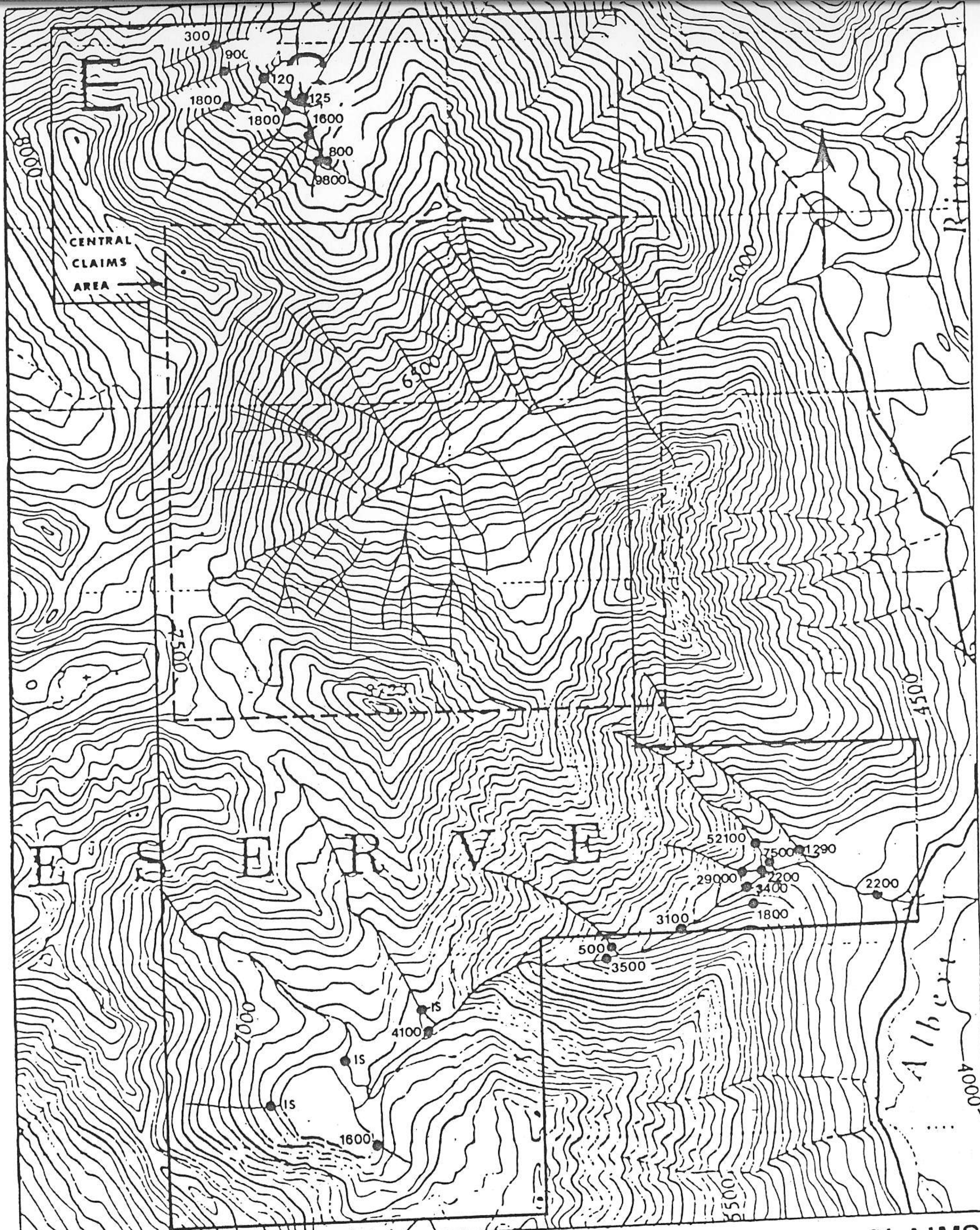
O p.p.m. As

in Heavy Mineral Non Magnetic Concentrates

Estimated Regional Threshold = 130 p.p.m. As

based on n = 138 results

FIGURE 14



0 1000 2000
Metres

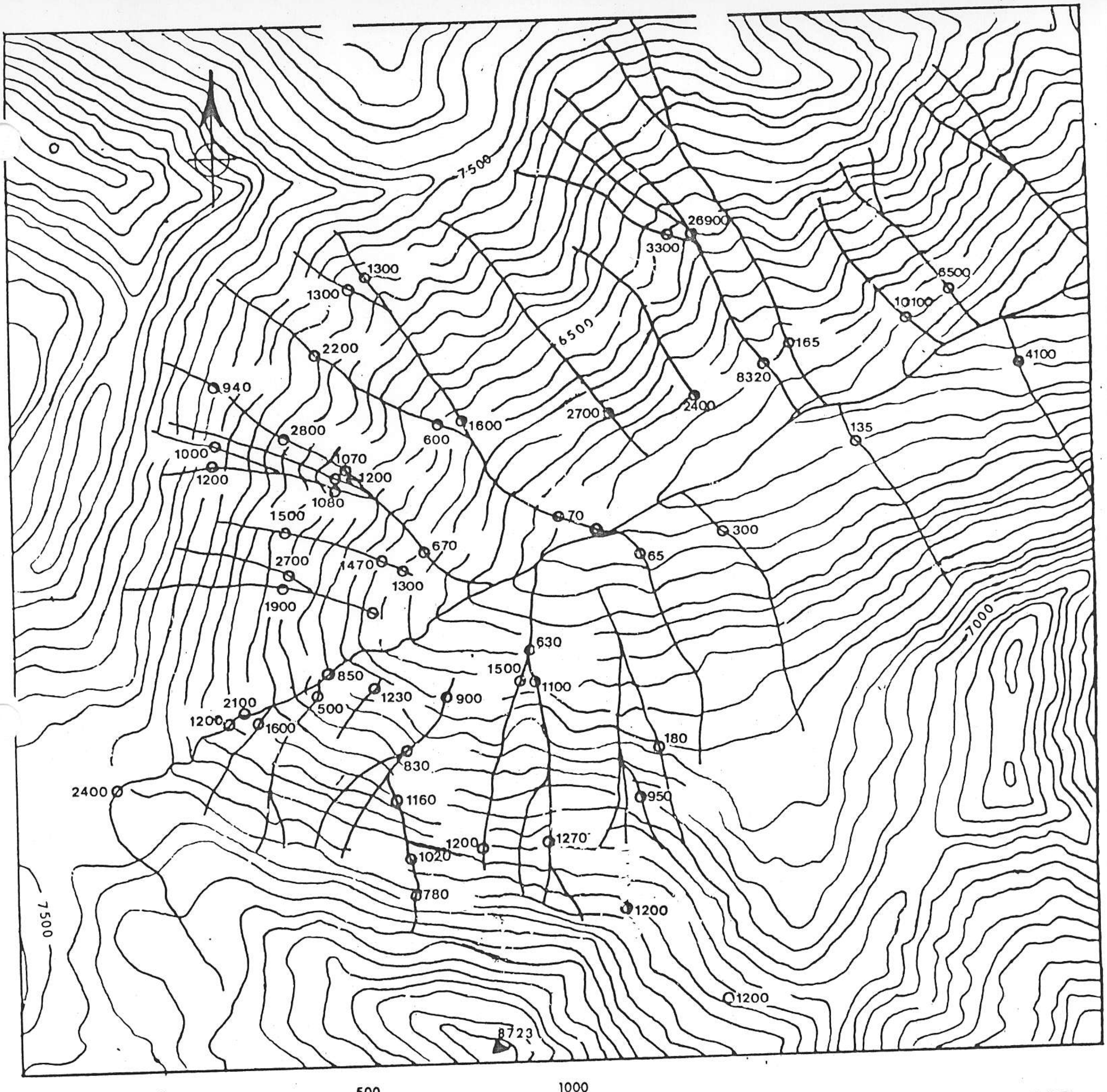
ALBERT RIVER CLAIMS

GEOCHEMICAL RESULTS : Copper

LEGEND

O ppm Cu
in Heavy Mineral Non Magnetic Concentrates

FIGURE 15



LEGEND

O p.p.m. Cu

in Heavy Mineral Non Magnetic Concentrates

Estimated Regional Threshold = 200 p.p.m. Cu

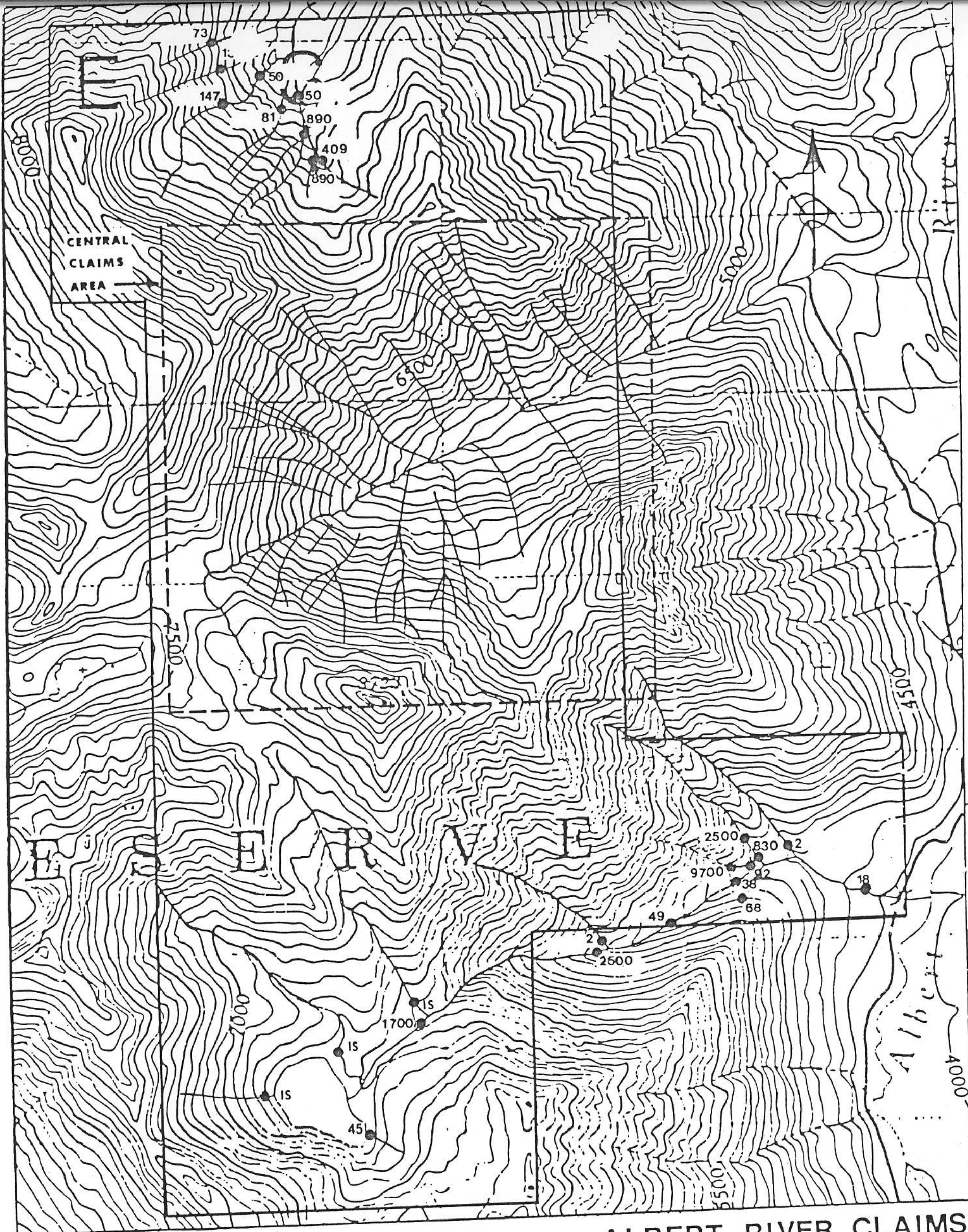
based on n = 749 results

ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

GEOCHEMICAL RESULTS : Copper

FIGURE 16



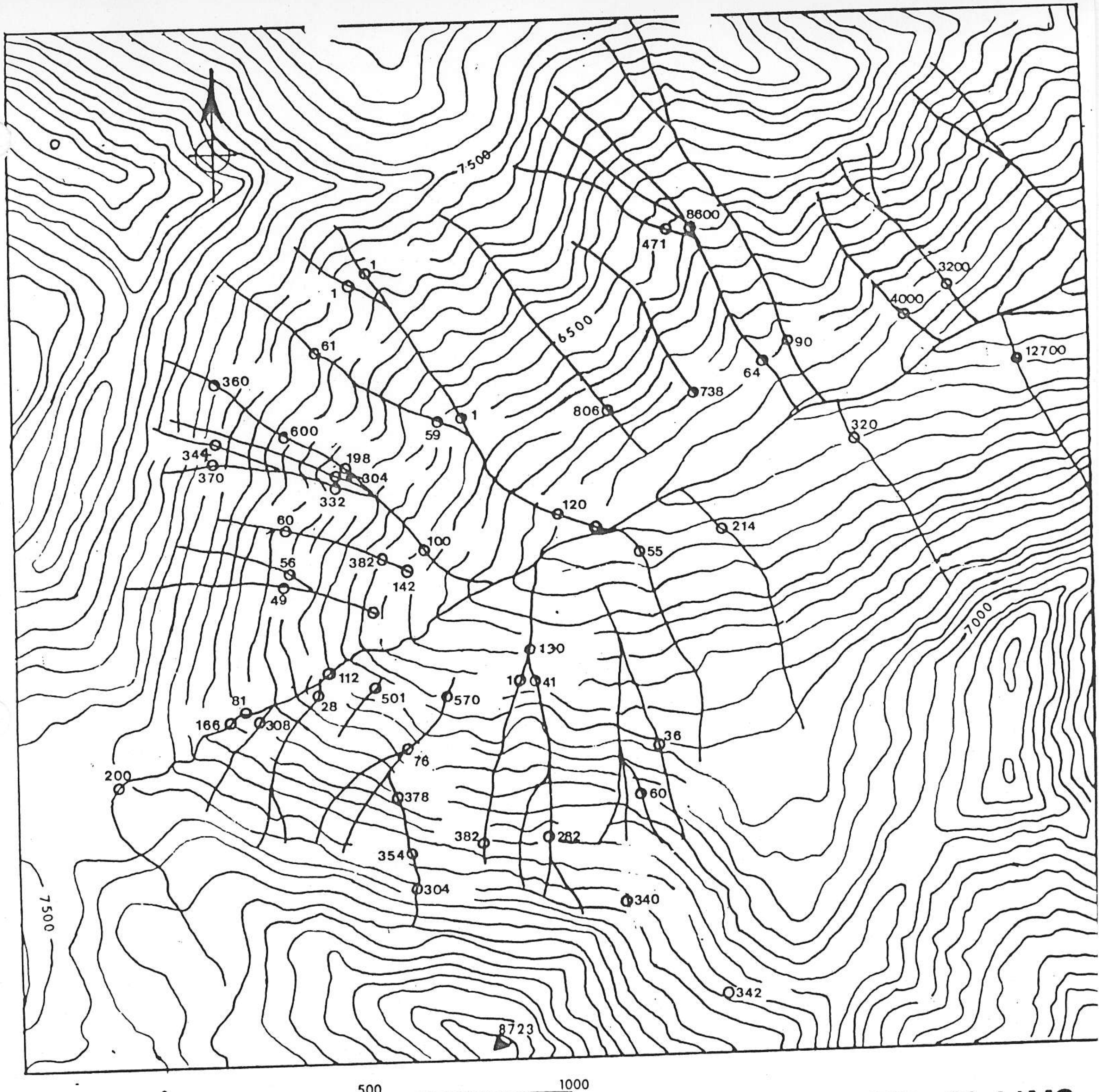
LEGEND

O p.p.m. Pb
in Heavy Mineral Non Magnetic Concentrates

ALBERT RIVER CLAIMS

GEOCHEMICAL RESULTS : Lead

FIGURE 17



LEGEND

O p.p.m. Pb

in Heavy Mineral Non Magnetic Concentrates

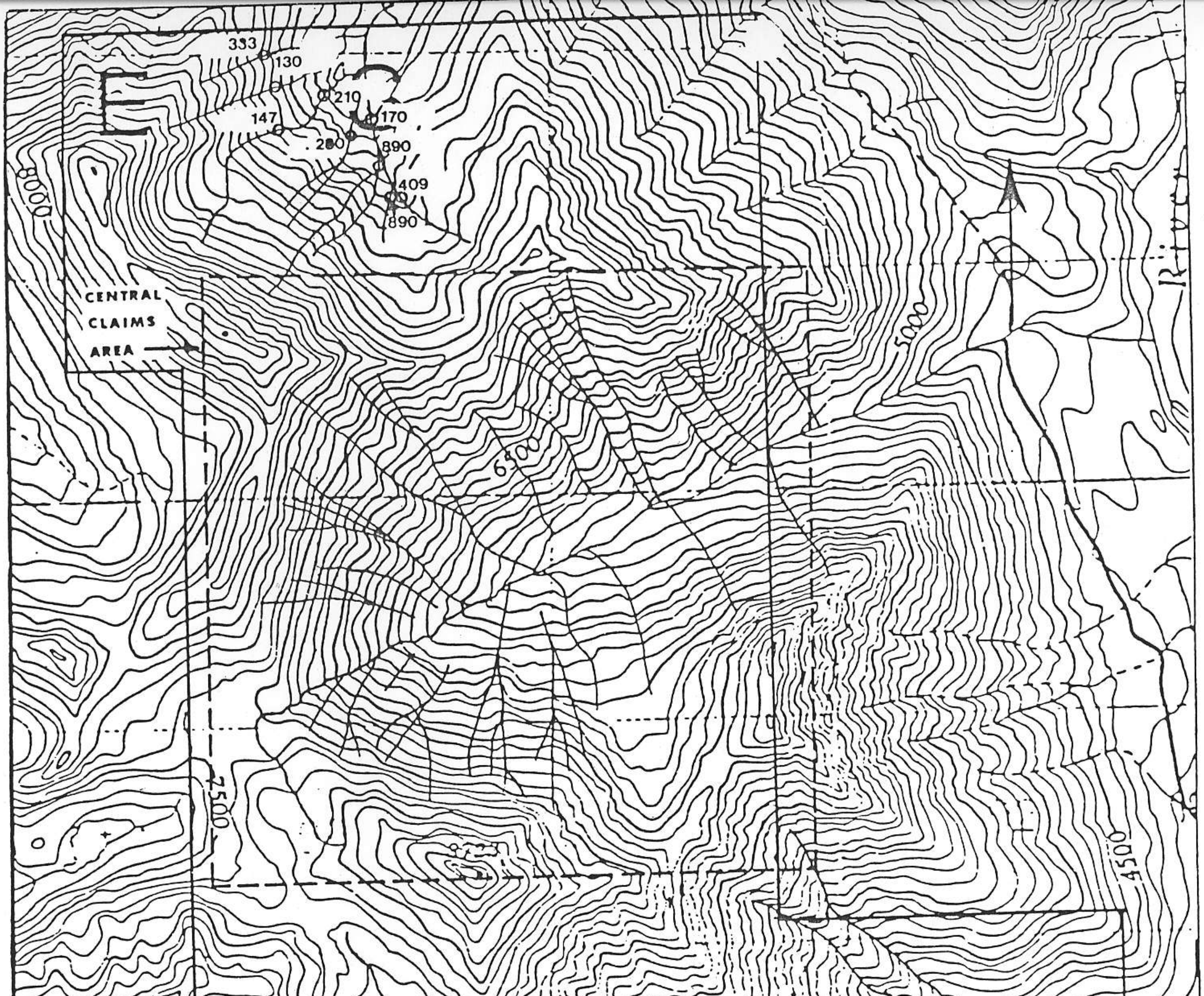
Estimated Regional Threshold = 120 p.p.m.Pb
based on n = 338 results

ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

GEOCHEMICAL RESULTS : Lead

FIGURE 18



ALBERT RIVER CLAIMS

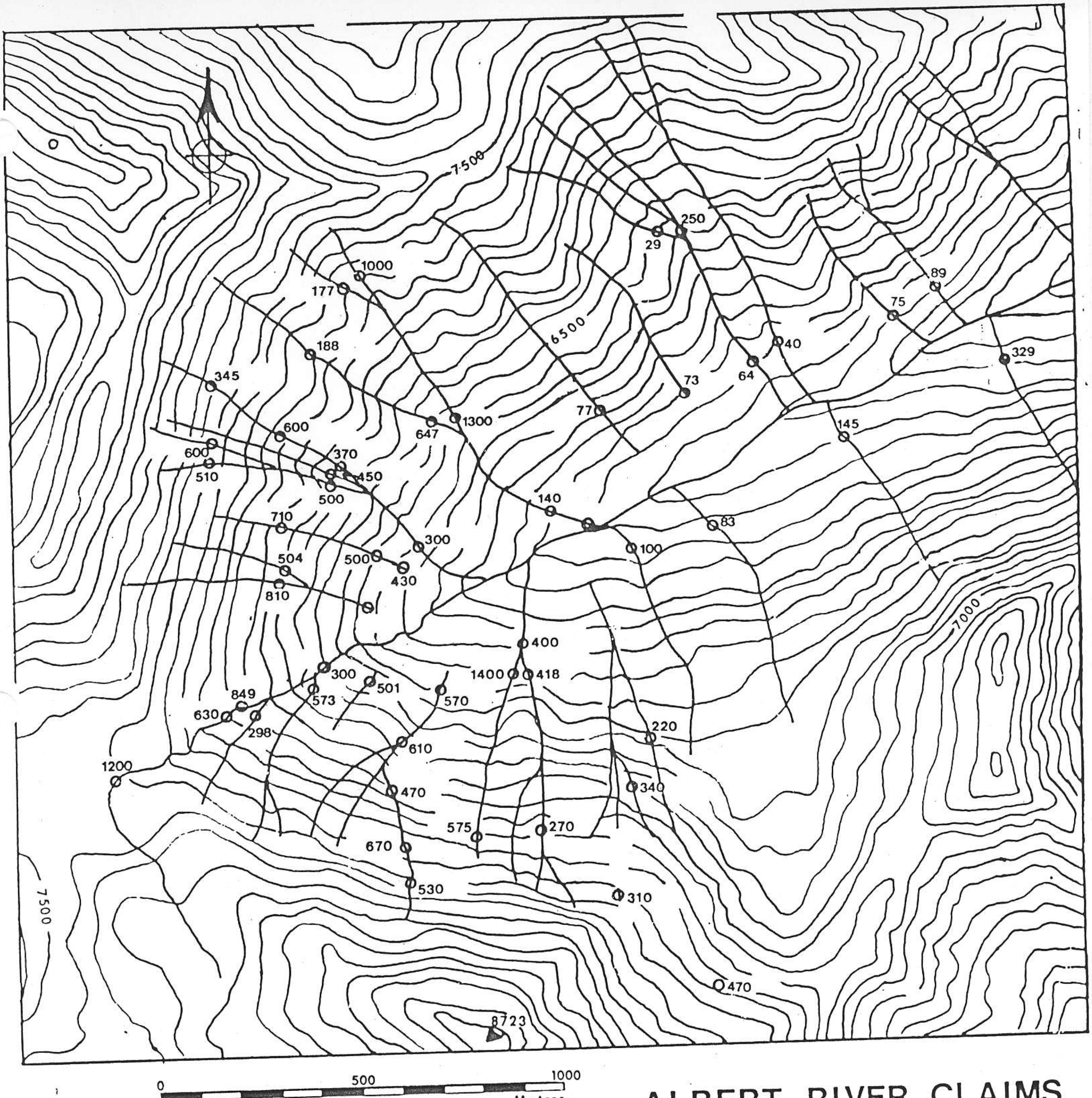
GEOCHEMICAL RESULTS : Zinc

LEGEND

O p.p.m. Zn

in Heavy Mineral Non Magnetic Concentrates

FIGURE 19



LEGEND

O p.p.m. Zn
in Heavy Mineral Non Magnetic Concentrates

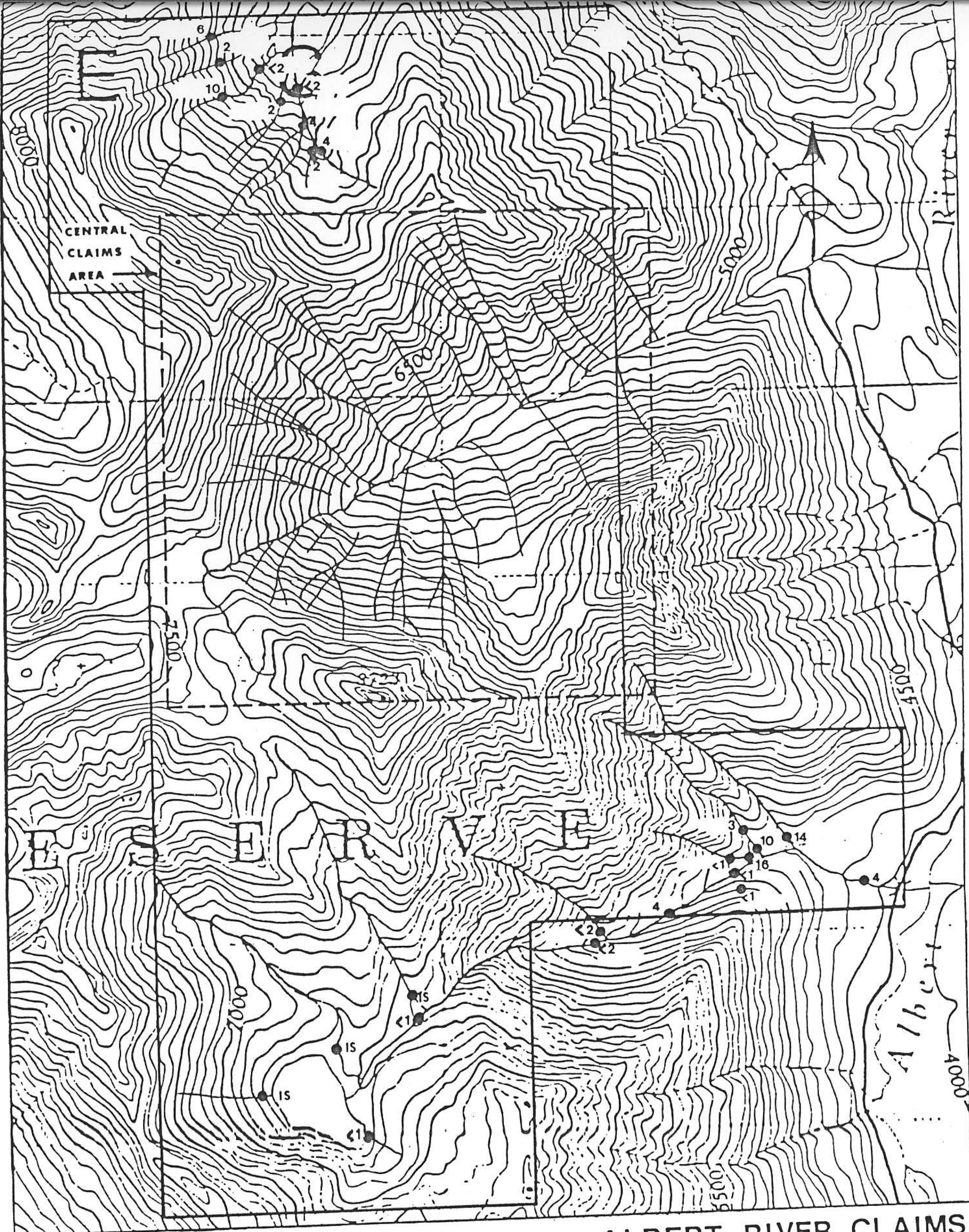
Estimated Regional Threshold = 300 p.p.m. Zn
based on n = 760 results

ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

GEOCHEMICAL RESULTS : Zinc

FIGURE 20



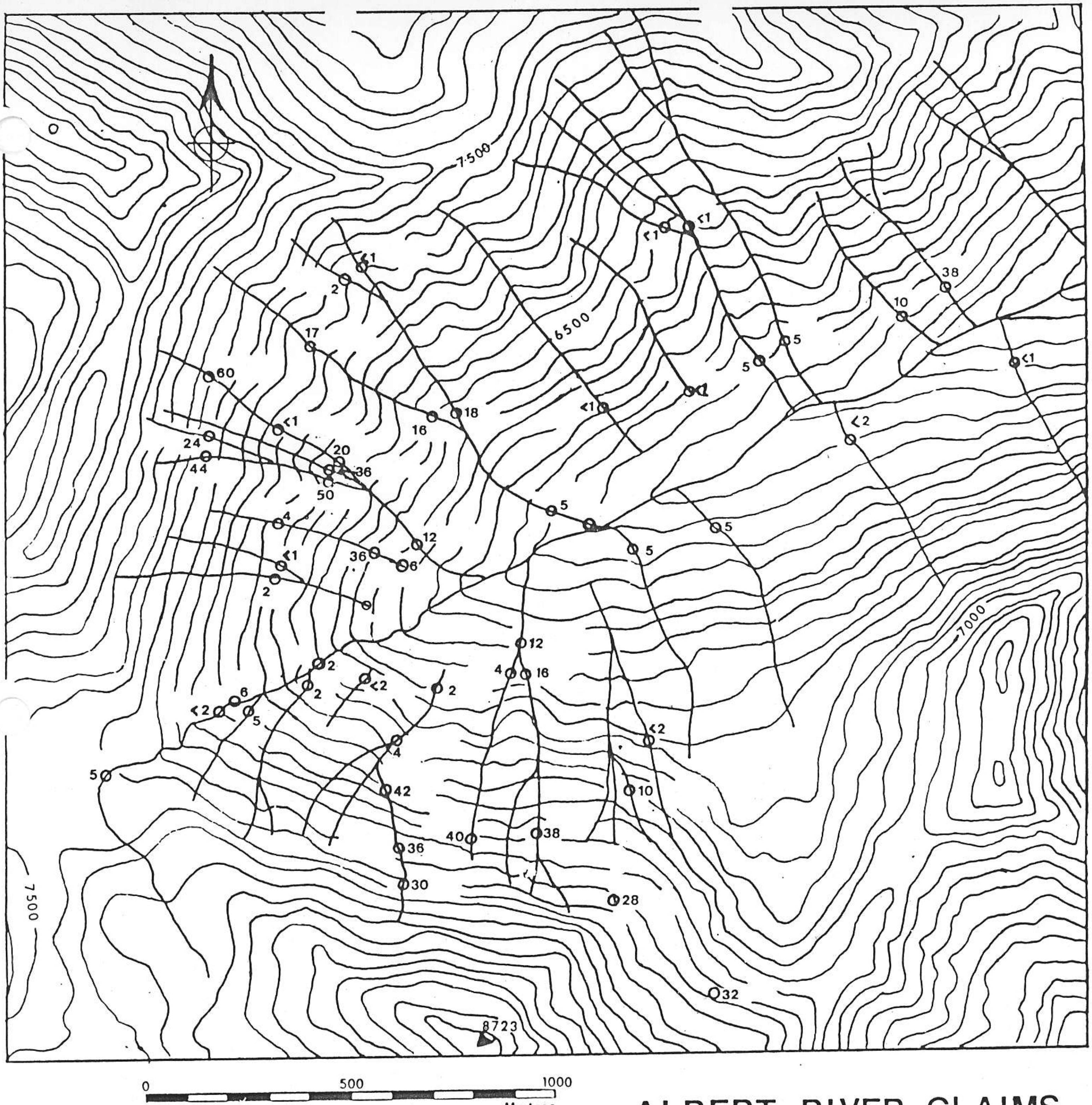
ALBERT RIVER CLAIMS

GEOCHEMICAL RESULTS : Molybdenum

LEGEND

O ppm Mo
in Heavy Mineral Non Magnetic Concentrates

FIGURE 21



LEGEND

O p.p.m. Mo

in Heavy Mineral Non Magnetic Concentrates

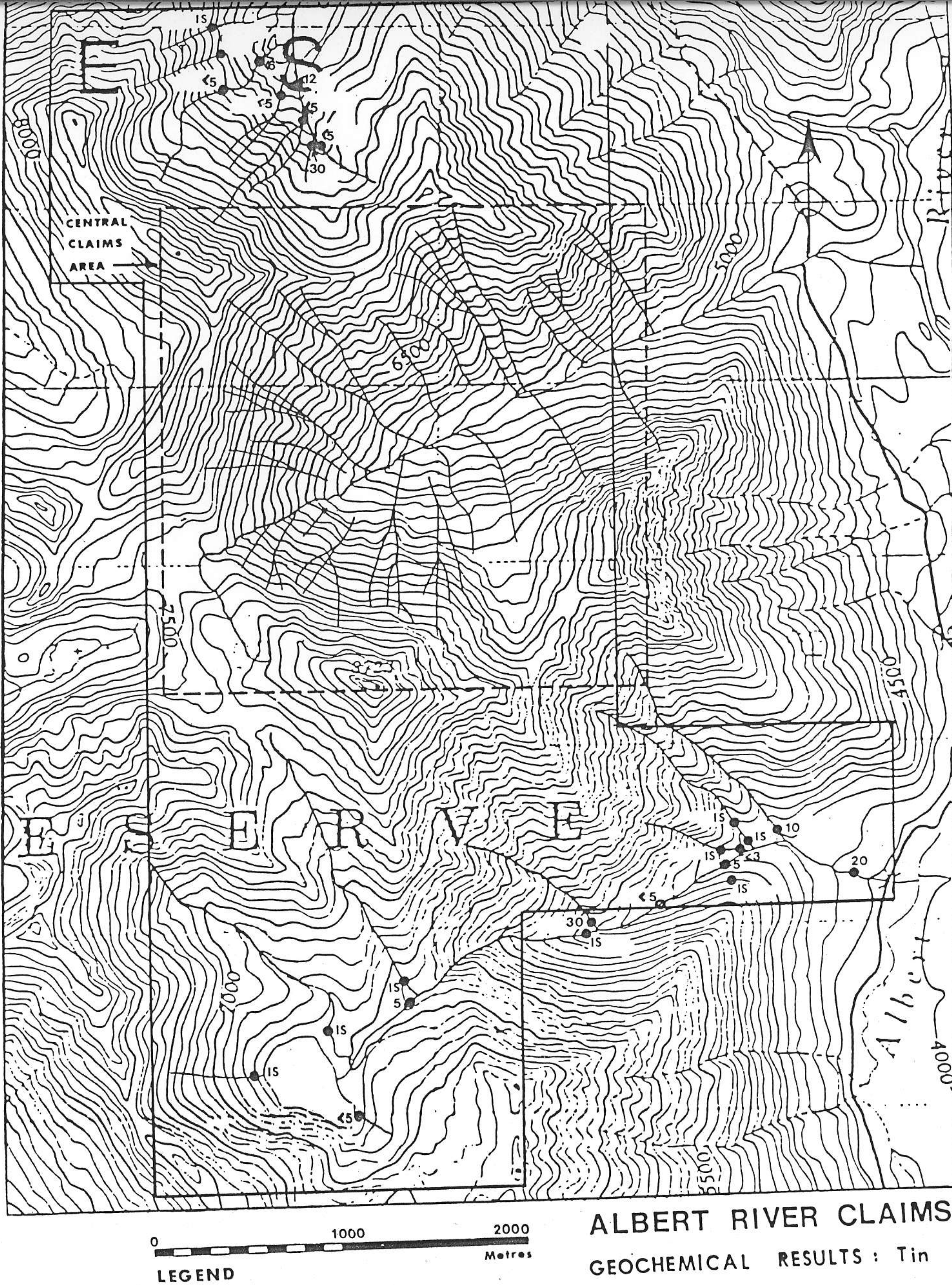
Estimated Regional Threshold = 17 p.p.m. Mo
based on n: 457 results

ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

GEOCHEMICAL RESULTS : Molybdenum

FIGURE 22



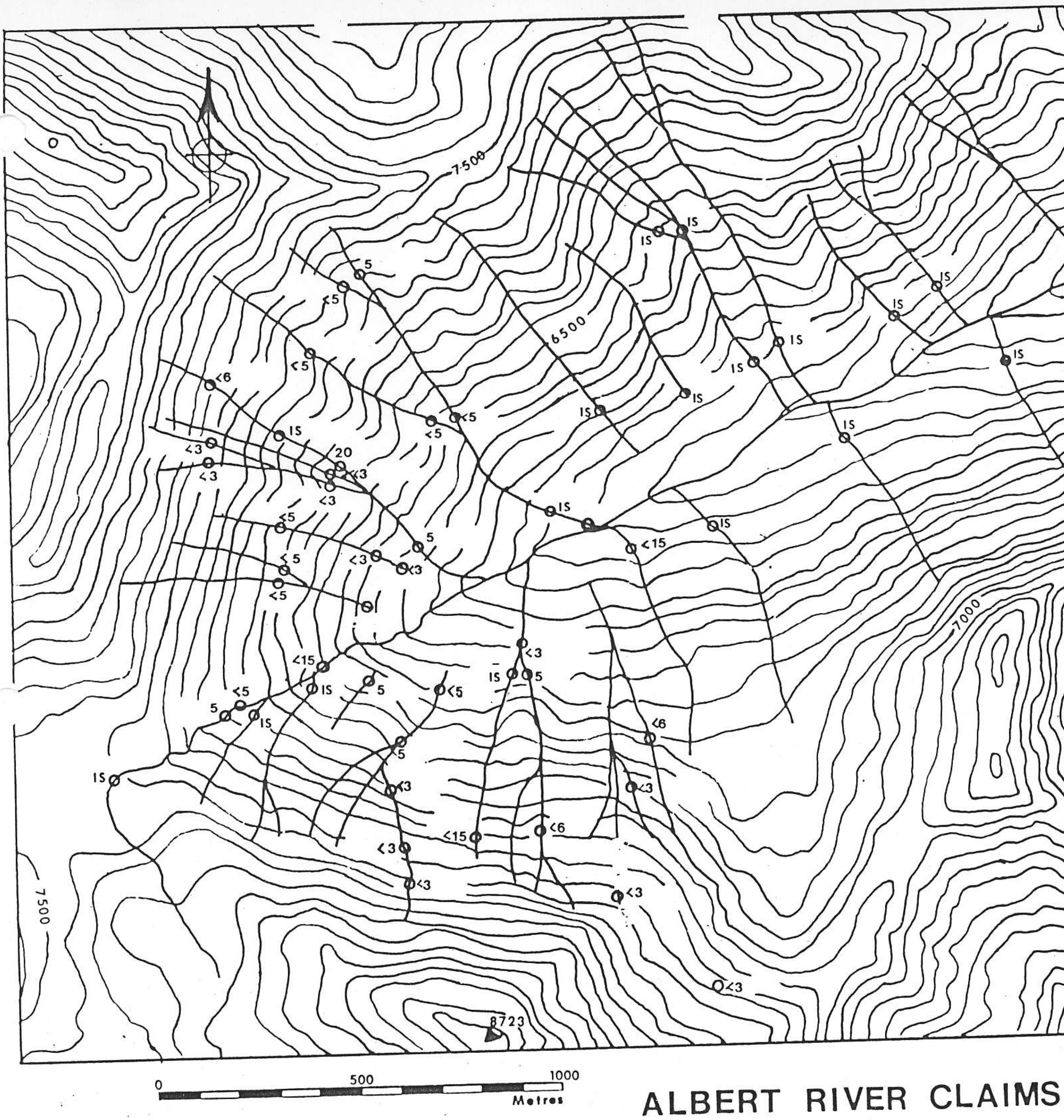
LEGEND

● p.p.m. Sn in Heavy Mineral Non Magnetic Concentrates

ALBERT RIVER CLAIMS

GEOCHEMICAL RESULTS : Tin

FIGURE 23



LEGEND

O p.p.m. Sn

in Heavy Mineral Non Magnetic Concentrates

Estimated Regional Threshold = 70 p.p.m.Sn

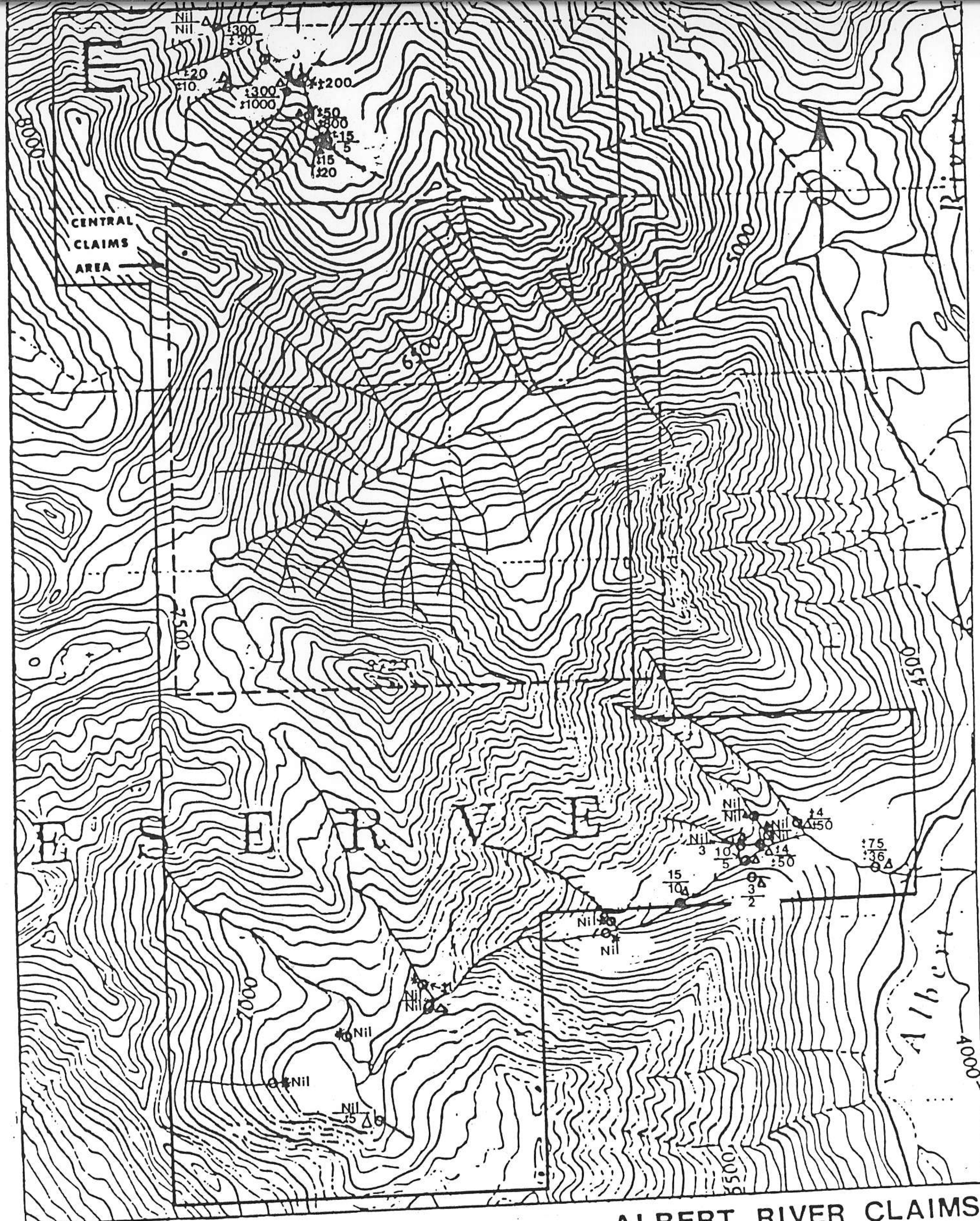
based on n = 187 results

ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

GEOCHEMICAL RESULTS : Tin

FIGURE 24



ALBERT RIVER CLAIMS

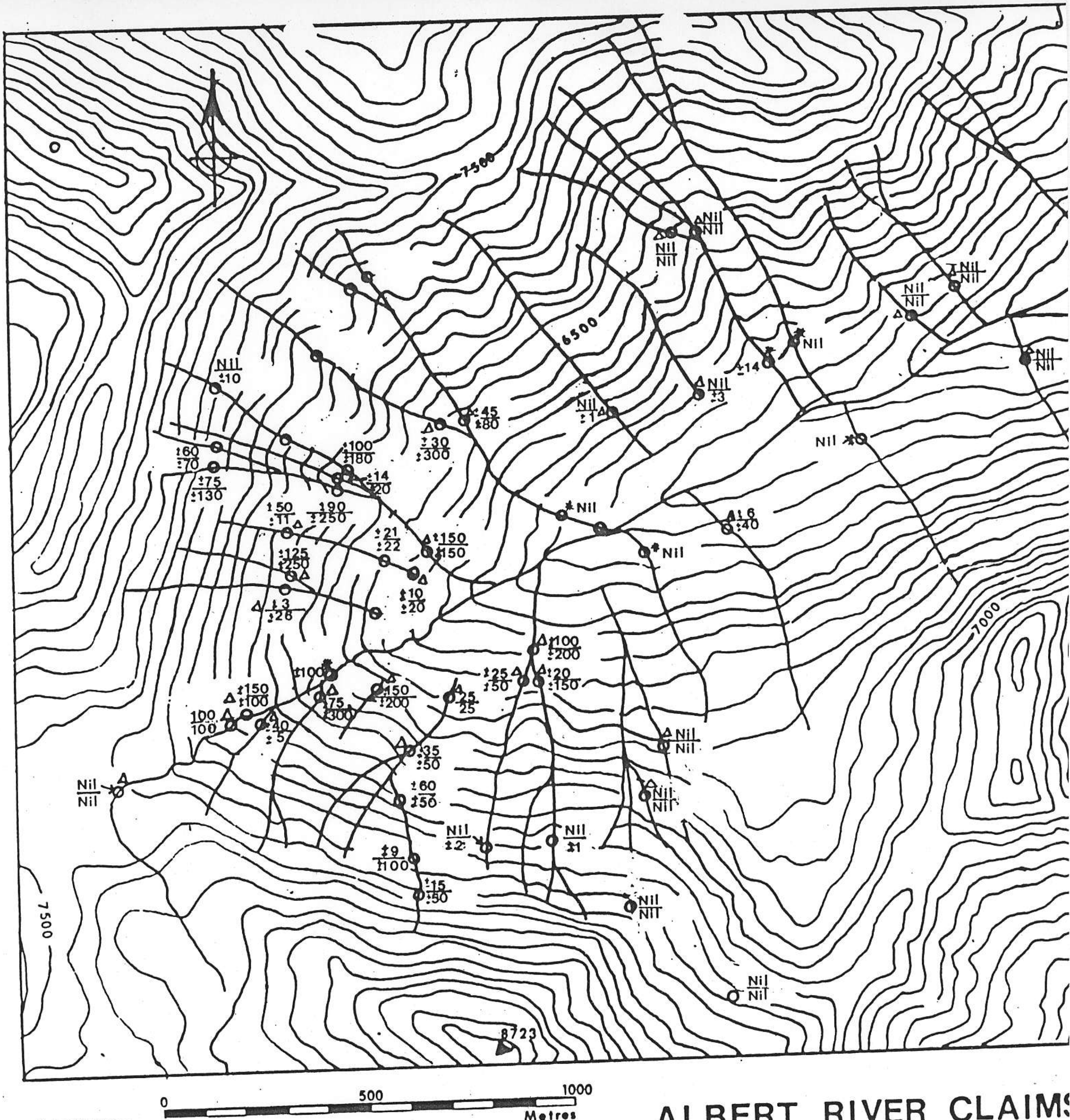
SCHEELITE GRAIN COUNTS

FIGURE 25

LEGEND:

* o Grain count in -20HIN

△ o Grain count in -20+60HN / Grain count in -60HN



LEGEND:

o Grain count in -20+60HIN / Grain count in -60HN

*o Grain count in -20HIN

△o Grain count in -20+60HN / Grain count in -60HN

ALBERT RIVER CLAIMS

CENTRAL CLAIMS AREA

SCHEELITE GRAIN COUNTS

FIGURE 26

GEOPHYSICAL REPORT

Introduction

During the 1984 field season, a Ground Magnetometer Survey and an Induced Polarization test were carried out on the Albert River Tungsten property on behalf of Dia Met Minerals Ltd.

The magnetometer survey was conducted by Stan Emerson and Brent Carr of C.F. Mineral Research Limited. The corrected and plotted readings were contoured and interpreted by P. Nielsen, B.Sc., Geophysicist.

The purpose of the survey was to verify and pinpoint a small airborne anomaly which was coincident with anomalous geochemical tungsten values.

Due to the extremely rough and steep topography, the survey grid lines were unequally spaced and took on various orientations resulting in irregularly spaced data.

Concurrent to the magnetic coverage, an Induced Polarization Survey was attempted over the magnetic-geochemically anomalous area but had to be abandoned due to the low signal-to-noise ratio caused by highly conductive shales.

The I.P. work was carried out by Peter Walcott & Associates Ltd. under the supervision of P.P. Nielsen.

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Due to insufficient valid I.P. readings, only the magnetic survey is discussed in this report.

Instrumentation

The grid was surveyed using a Geometrics Model GM-122 Proton (total field) magnetometer and a Barringer base station magnetometer with a strip chart (analogue) recorder.

Field Procedure and Treatment of Data

Total field readings were taken at 20 metre intervals along the Base-line (N 60°E bearing) and along the cross-lines and entered into a note book along with the grid locations and time of readings. These values were subtracted from the datum of 57,000 gammas and corrected for diurnal variations using the base station recordings.

The corrected data was then plotted and later contoured on a map having a scale of 1" = 50 metres.

Discussion of Results and Interpretation

The magnetic contour map indicates a total relative magnetic relief varying from 460 gammas to 531 gammas.

The magnetic values vary from 460 to 531 gammas for a total magnetic relief of 71 gammas. This occurs over a small dipolar anomaly center-ed at 2160E; 0220S. This feature, along with another similar dipolar

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anomaly to the west, appears to occur along the margin of a large subtle magnetic high (i.e. greater than 505 gammas) which is circular in shape, approximately 550 metres in diameter, and is centered at grid co-ordinates 2020E; 0020S.

Although this anomaly occurs in extremely steep and varied terrain, is of low amplitude, and is the result of irregularly spaced data, it does occur in the area of densest survey coverage. This, coupled with supportive anomalous tungsten values and the previous airborne magnetic results, leads one to believe in its validity, especially when it occurs in an area of overlying non-magnetic sediments.

There is, therefore, the distinct possibility that this feature could represent a buried intrusive body (plug or pluton). The two dipolar features within this subtle magnetic high could be caused by local, near-surface concentrations of pyrrhotite.

Recommendations and Conclusions

Due to the nature of the terrain and the highly conductive sediments, it is unlikely that any further electrical geophysical techniques should be applied to the property.

However, the ground magnetometer survey appears to have been of value and further coverage could be contemplated subject to testing by drilling of the existing anomalies.

Respectively submitted,

P.P. Nielsen, B.Sc., Geophysicist