KUSP PROPERTY

GEOLOGY, GEOCHEMISTRY, GEOPHYSICS
ON KUSP 1, 2, 4 CLAIMS
SLOCAN MINING DIVISION

latitude 50°08.5'N, longitude 117°36.5'W Part 1 of 2

6845

Claims owned by: Canbrika Developments Ltd.
Work paid for by: Dome Exploration (Canada) Ltd.
and Ranworth Explorations Ltd.
Consultants: J. R. Woodcock Consultants Ltd.
Author: J. R. Woodcock

August 30, 1978

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KUSP PROPERTY

LOCATION AND ACCESS

The Kusp Property is at latitude 50° 08.5' N, longitude 117° 36.5' W, on Map 82K-4E. Summit Lake lies along Bonanza Creek, just north of the property.

The claims extend from the bottom of the valley of Bonanza Creek southward up the steep slopes to the top of some very rugged mountains (Rugged Peak, Big Sister Mountain). Over a horizontal distance of 1 3/4 miles (2.8 km) elevations rise from 2500 feet (830 meters) to almost 8000 feet (2670 meters). The slopes on the south side of the rugged mountains are less steep and are drained by McDonald Creek.

The very steep north-facing slopes have been subjected to a severe forest fire and an almost complete burn. Subsequently a dense growth of brush and young evergreen trees has returned, making access up the slopes extremely difficult. Tops of peaks are above timber line.

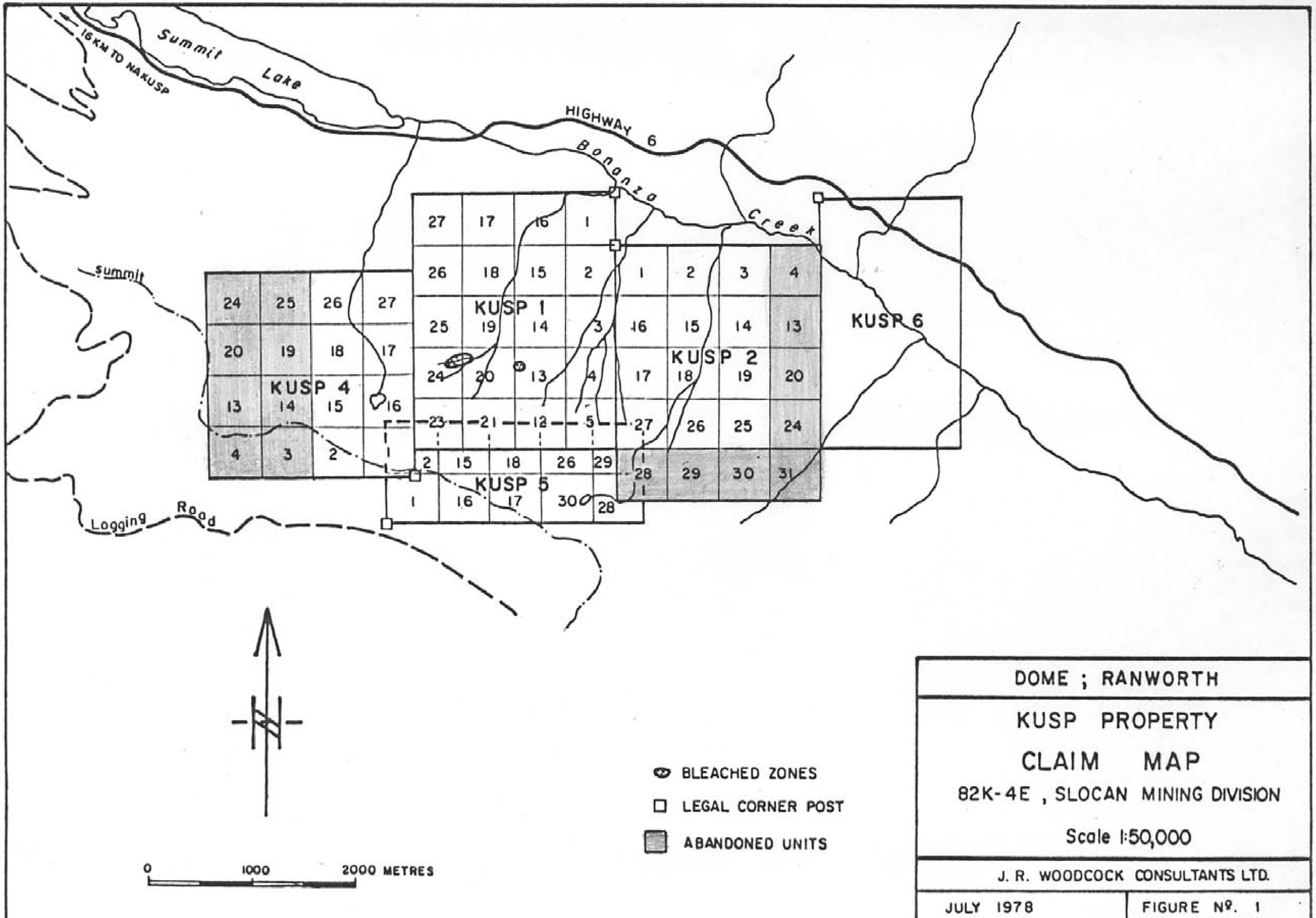
Outcrops are abundant at the tops of the rugged peaks and in the head of the cirques which drain northward through various small streams into Bonanza Creek. On the forest-covered slopes, outcrops occur in the creek beds and also in places on the steep interfluvial areas.

Although roads exist quite close to the property, access at present must be by helicopter. The closest helicopter is at Revelstoke, 65 miles (100 km) to the northwest. Also, planes and helicopters are based at Kelowna, 90 miles (140 km) to the west. An airstrip exists near Nakusp, ten miles southwest of the property, and this is generally serviced in the summer months by scheduled flights from Revelstoke and Kelowna.

A paved highway (No. 6) passes along the valley of Bonanza Creek, less than one mile from the north edge of the property. Canadian Pacific Railway has an unused line also along the bottom of the valley. The closest access roads are logging roads in the upper parts of McDonald Creek. These roads have been built to within two miles (3 km) of the bleached zone.

HISTORY

The writer detected the large gossan zone and associated bleached areas with an aerial reconnaissance. Silt samples taken along the foot of the steep mountain slope from creeks draining this gossan area yielded some highly anomalous values in copper, lead, and zinc. On September 22, 1977 the writer, accompanied by Terry Booth, returned to the property with a Jet Ranger to get additional silt samples and rock samples; to examine the bleached zone; and to verify that the anomalous metal values in the silts are coming mainly from the bleached zone.


16 KM TO NAKUSP
Summit Lake
HIGHWAY 6
Bonanza Creek
summit
Logging Road
KUSP 1
KUSP 2
KUSP 4
KUSP 5
KUSP 6
BLEACHED ZONES
LEGAL CORNER POST
ABANDONED UNITS
0 1000 2000 METRES
DOME ; RANWORTH
KUSP PROPERTY
CLAIM MAP
82K-4E , SLOCAN MINING DIVISION
Scale 1:50,000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 1

The geochemical silt stream survey of 1977 and a few additional stream samples taken from the upper parts of Kusp Creek in 1978, are presented in the report. In 1978, the grid lines were soil sampled and the samples were analyzed by Vangeochem Lab Ltd. for copper, lead, and zinc.

GEOLOGY

General

The mountains south of Summit Lake owe their high and rugged topography to the resistant volcanic rocks which underlie this part of the Lardeau map sheet. Geological Survey maps(Hyndman 1968 and Reid 1975) show an area eight miles (13 km) long and up to two miles (3.2 km) wide underlain by the volcanic rocks that form the backbone of these rugged mountains. These geologists assign the volcanic rocks to the Slocan Group (Triassic to Lower Jurassic). This group includes augite metabasalt and andesite flows and tuffs. Surrounding this volcanic group are some sedimentary rocks also included in the Slocan Group and presumably underlying the volcanic rocks. These include the gray to black phyllite, argillite, quartzite with minor tuffaceous sediments near the top. In order to get an elliptical outline to the volcanic area (terminating at both ends) the geologists have suggested a synclinal structure.

The present writer prefers to regard this as a basin of volcanic deposition with the flow rocks along the backbone of the mountains representing the base and with tops to the north. This basin is now represented by overturned strata which dip steeply to the southwest. Cross bedding and graded bedding in some of the dark sedimentary rocks 2000 feet (600 m) west of Zone 1 indicate that the tops in this locality are to the north although the sediments dip steeply to the south. Attitudes in the mapped area show a strike averaging about 100° azimuth and a moderate to steep dip southwest.

Rock Types

Because the detailed mapping was limited to the upper reaches of Kusp Creek and adjacent areas, some of the following suggestions are tentative. The writer suggests that the backbone of this mountain range is composed of volcanic flow rock. Some of this is a porphyry which contains abundant phenocrysts of plagioclase and of hornblende. This porphyry, resembling (in hand specimen) the augite porphyry of much of the Triassic volcanic terrain of British Columbia, is a dark gray rock. In addition to this type of porphyry there is also a gray intermediate volcanic rock which is probably also a flow rock.

North of this backbone flow area the volcanic horizon consists largely of pyroclastics interbedded with sedimentary rocks. These sedimentary and pyroclastic horizons change dramatically along strike in lithology and in thickness. Thus, although detailed mapping can break the sedimentary horizons and the pyroclastic horizons into a number of rock types, the writer suggests two main pyroclastic horizons separated by and capped by sedimentary horizons.

Along Kusp Creek two types of coarse pyroclastics are prevalent. These include a pyroclastic which contains numerous fragments of the gray volcanic rock mentioned above and a second pyroclastic horizon which contains fragments and matrix of a black volcanic rock. This black volcanic rock is a porphyry which contains ortho-pyroxenes and could possibly be called a dacite. Both of these pyroclastic horizons contain abundant pyrite and form conspicuous gossans. Also both of the pyroclastic horizons grade laterally very sharply into a finer-grained volcanic which contains considerably less pyrite.

The intervening sedimentary horizon contains considerable black slate. However it also changes sharply laterally, generally into a grit or a conglomerate. In places this horizon, especially in the upper (northern) parts consists of a sharpstone conglomerate in which some of the fragments are a greenish colour and may be of tuffaceous origin.

The upper pyroclastic horizon is the area of exploration interest. The gray coarse-grained pyroclastic forms the base. This includes fragments of the black volcanic and possibly also some interbeds of the black pyroclastic. This is overlain and interbedded with the black pyroclastic. The top part of this main pyroclastic horizon includes relatively fine-grained tuffaceous rocks which display a cleavage. These tuffs become more acidic at the upper contact and grade into white pyritic tuff beds which form the bleached horizons of Zones 1 and 2.

The main pyroclastic horizon is capped at Zone 1 by a black slate. However these black slates also have interbeds and grade laterally into a coarse clastic which contains considerable greenish clasts and resembles somewhat the sharpstone conglomerate of the central sedimentary horizon.

To the north and presumably stratigraphically higher above the volcanic formation is a formation of black slate. This has been mapped down to the valley floor of Bonanza Creek by government geologists. In many places this has interbeds of gray volcanic rock which may be a tuff.

Some small diabasic intrusions occur in places. An erratic mixture of these with the intruded black slate was noted about one-half mile (0.8 km) southeast of the east end of Summit Lake. Another smaller one occurs at the junction of Kusp Creek with the tributary that drains Zone 1.

<u>Alteration</u>

All of the volcanic rocks examined in thin section have been altered. This even includes the competent appearing lava flows which form the backbone of the mountain range. These lavas have been altered to abundant carbonate and sericite. The plagioclase phenocrysts are now largely sericite and the rock is characterized by large patches of calcite which, in places, contain remnants of hornblende. Some phenocrysts have been largely replaced by chlorite.

The pyroclastics, especially the gray ones, in places contain enough carbonate to make the rock weather like a limestone. It effervesces readily in dilute HCl. In places this pyroclastic rock has a lensy foliation and includes white bands and lenses that are largely calcite. The darker part of this banded foliated rock consists largely of plagioclase crystals within a finer-grained matrix and many of the plagioclase phenocrysts are highly sericitized. Sericite and carbonate are ubiquitous throughout most of the rock.

Thin section examinations of the finer grained foliated tuffaceous rock in the uppermost part of the main pyroclastic horizon show that the rock was composed of a variety of lithic fragments which are now represented by variations in composition and grain size. In some of these elongated fragments, quartz is a predominant mineral. In places it forms a mosaic with a graphic texture. In other larger fragments a fine-grained gray matrix contains abundant disseminated sericite. Relatively coarse-grained muscovite forms septa running throughout the section. This material has a shredded appearance and may be replacement of biotite or some other mafic mineral. In some places the micaceous minerals have been altered to chlorite. Carbonate is absent.

The white tuffaceous rock which forms the bleached horizon contains concentrations of a clay mineral (probably kaolinite). It also contains elongated concentrations or mosaics of quartz crystals which, in places, have a distorted or bent graphic texture. It is notable that these fine-grained tuffaceous rocks which are highly sericitized and altered to clay lack the abundant carbonate found in the coarser pyroclastics and in the lava flows.

Surface weathering converts this altered white rock to a sticky white clay-rich "soil". In places on Zone 2 this sticky material is at least 0.6 m thick. It readily flows downhill and prevents vegetation from gaining a foothold.

Rock Slides

A hummocky topography at Zone 1, including little closed basins, on such steep slopes indicates rock slides. These can be seen on the photographs with the aid of the stereoscope. The approximate outline of the overall area of sliding is shown on the geological map. Thus much of the anomalous zone is underlain by rubble which has moved down hill. Even the cliffs with apparent uniform dip to the southeast appear to have had some downhill movement as small enclosed basins in places lie on top and back from these cliffs of exposed rock. The continuity of geological contacts interpreted from the EM 16 work indicates that movement of the so-called outcrops has not been great and that the thickness of slide material is probably less than 15 meters.

GEOCHEMISTRY

Stream Geochemistry

The results of the initial sampling along the bottom of the valley are shown on separate sketches (Figures 2 to 5) and the results for the more detailed sampling at the head of the anomalous creek are shown on Figures 6 to 10.

A large number of these silt samples would be considered anomalous when compared with the background and threshold values used in much of the regional work. However the number of silt samples from the Kusp claim area are insufficient to make a significant histogram or statistical analysis. Most of the streams sampled along the valley drained the extensive pyrite zone. Thus, what appears to be background value on these small maps may, on a regional scale, actually be anomalous. In the initial sampling several streams along the bottom of the mountain slope were highly anomalous in copper, lead, and zinc. A subsequent examination of the aerial photographs indicated that these streams are all active distributaries of the same creek.

Sampling at the head of the anomalous creek has shown that the lead, most of the copper, and the higher zinc values are contributed by the bleached pyritic zone which occurs on a small western tributary of Kusp Creek. Highly anomalous zinc values are also contributed by the pyritic strata that occur above this tributary and anomalous copper values are found within the cirque area.

In addition to the base metals, silver, gold, arsenic, and antimony were obtained for several silt and rock samples. The results of these analyses are given in Table II. All of these metals are anomalous in the silt sample immediately below Zone 1.

Soil Geochemistry

Soil geochemistry at Zone 1 must be affected by the downslope movement of the rock debris and so can only be useful for general purposes. The lead anomaly is of major interest as this seems to define what the writer believes is the main part of the zone. It is interesting to note that the lead anomaly extends northward onto the area presumably underlain by the capping black slates.

Copper and zinc are also anomalous at Zone 1. In the overall outline they conform quite closely to the lead anomaly; however, in detail, there are some differences in the patterns.

At Zone 2 the grid was not oriented exactly according to the strike of the strata because such orientation would have entailed running the cross lines up and down some very steep slopes. The lead in soil anomaly is generally co-extensive with the overall EM 16 anomaly and the highest values are found in the treeless clay zone. Although the copper in soil does not show any good distinctive patterns and any high anomalous values, some of the higher values do occur along the axis of the EM 16 conductor. The zinc values show no relationship to the EM conductor or to the known geology.

GEOPHYSICAL WORK

A magnetometer profile was taken across Zone 2. In this zone rock slides are absent and the results might be more meaningful than on Zone 1. However the readings showed no variation whatsoever and so the survey was not completed.

As a preliminary step and because of the extremely steep topography the writer used EM 16. Subsequently, Richard O. Crosby and Associates Ltd. was contracted to check Zone 1 with a Turam EM instrument. The results of Crosby's survey will be presented in a separate report by his company.

In establishing the grid, stations were set at 10-meter horizontal spacing and the vertical angles between stations were noted. These readings were used to draw the profiles of topography as shown on the EM 16 graphs and to draw a topographical map for both Zone 1 and Zone 2.

For the work on the EM 16, the base at Cutler, Maine was used. This is at an azimuth of 80° from the property. Progress or direction of surveying was northward along the grid lines and the readings were taken with the instrument pointing to azimuth 360° and rotating about an axis with azimuth 80°. Tilt angles are considered the most important reading and were recorded for all of the stations and were plotted on all graphs. In addition the quadrature readings were taken at most stations and were also plotted on the graphs. In all cases the readings were taken on a steep topography and therefore the 0° could not be used for a datum. For some graphs an estimated datum, fitting the tilt angle profile, was drawn in an attempt to determine the tilt angle cross-over. It is the cross-over (from positive to negative) of this estimated datum that is considered important.

Probably the most important results are those that have been filtered according to the Fraser technique. This technique involves two simple arithmetic manipulations.

(a) New values are established between each station by adding the recorded values at each adjacent station.

(b) A second set of new values is established for points between the stations by treating the values obtained in step (a). For each position the "step (a) value" for the position ahead is subtracted from the "step (a) value" for the position behind. An example for L 0+00 of Zone 2 is as follows:

Station	Tilt Angle	Fraser Filter	
1+00 S	-28°		
		-56	
0+90 S	-28		
		-54	-2
0+80 S	-26		
		-54	-1
0+70 S	-28		
		-53	-1
0+60 S	-25		
		-53	+4
0+50 S	-28		
		-57	
0+40 S	-29		

The Fraser-filtered values are then plotted on a plan which can be correlated with the geology or topographical features.

Zone 2 presents a simple picture as it is not complicated by a rock slide. At this place the tuffaceous rocks have a cleavage which is probably parallel to the bedding. The dip is to the south and the strike is easterly parallel to the axis of the EM-16 conductor. The overall zone of conductivity lies over and north of the conspicuous clay zone and the axis of the conductor actually lies along an area of abundant pyrite just to the north of the conspicuous clay zone.

For Zone 1 interpretations of the EM 16 results have been made on the graph profiles and these interpretations have been transferred to the plan (Figure 16). This plan shows the contoured values for the Fraser-filtered numbers and it also shows the suggested position of the shale-tuff contact as estimated from geological mapping without the benefit of EM work.

The changes in quadrature for each line are plotted with a dashed arrow and the tilt angle cross-overs are plotted with a normal arrow on the profiles and the plan (see legends). Normally the changes in quadrature are considered to correspond with the changes in rock type whereas the tilt angle cross-overs can correspond with a contact between rock types or with a conductive zone including such features as sulphide bodies and conductive water courses.

It is noteworthy that two cross-overs (L 0+60W and L 0+20 E) and one quadrature change L 2+00 E) correspond very closely with the suggested geological contact between the black slate to the north and the foliated acid tuffs to the south. About 30 meters further to the north, two more cross-overs (L 0+60 W and L 2+00 E) and two quadrature changes (L 0+20 E and L 1+00E) form another parallel feature which probably represents a change from black slates to a different rock type going north. Another parallel rock contact occurs along the south flank of the Fraser-filtered EM anomaly (L 0+60 W, 0+55 S; L 0+20 E, 0+60 S; and L 1+0 E, 0+77 S). On L 1+00 E this lies very close to the mapped contact of foliated pyritic tuffs on the north and coarser unfoliated pyritic pyroclastics on the south. Thus it appears that three contact features have been detected by the EM 16 work.

In three places quadrature changes and tilt angle cross-overs are almost coincident (L 1+00 E, 0+20 S; L 2+00 E, 0+60 S; and L 2+00 E, 0+50 S). These three places coincide with the crest of the Fraser-filtered contoured anomaly and also with water courses. The running creek at L 1+00 E, 0+25 S and L 2+00 E, 0+60 S is very acidic and contains abundant copper and zinc. The third position (L 2+00 E, 0+50 S) is a potential water course but has no running water. If these anomalies are caused by the electrolyte formed by the anomalous creeks, it is strange that the acid metal-laden creek at L 2+00 E, 0+20 S does not also have a corresponding EM anomaly. Subsequent work with the Turam EM has largely eliminated these anomalies and to a certain extent substantiated the interpretation that they are formed by the electrolyte of the creek waters.

Further to the west the crest of the Fraser-filtered anomaly (L 0+60 W, 0+35 N) corresponds to the contact between the black slates on the north and the foliated pyritic tuffs on the south.

APPENDICES

APPENDIX I GEOCHEMICAL TECHNIQUES

APPENDIX II COSTS

TABLE I

KUSP CLAIM DATA

Name	No. of Units	Tag Number	Record Number	Date Staked	Date Recorded
Kusp 1	20	12052	450	July 17/77	Aug. 9/77
Kusp 2	20	12053	451	July 18/77	Aug. 9/77
Kusp 4	16	12055	452	Aug. 2/77	Aug. 9/77
Kusp 5	10	12056	504	Sept. 22/77	Sept. 30/77
Kusp 6	18	07138	598	March 23/78	March28/78

Although this property is only 15 miles northwest of the New Denver area which has been the center of silver exploration for many years, the claim maps of recent years show no claim holdings along the gossan zone. Work on the property in 1978 has revealed no prospector workings. There are some flagging markers, mainly belonging to Mr. Strebchuk, a prospector who was also investigating the anomalous metal content of the silts. Mr. Strebchuk subsequently staked adjoining claims to the east of the Kusp claims to cover a pyritic zone.

CLAIMS AND OWNERSHIP

The Kusp 1, 2, 4, 5, and 6 were staked and recorded in the name of John R. Woodcock; however the initial project was paid for by Canbrika Developments Ltd. Early in 1978 the property was optioned from Canbrika by Dome Exploration (Canada) Ltd. and Ranworth Explorations Ltd., both of Toronto. All of the claims are still in the name of John R. Woodcock except for the Kusp 1 claim which had been transferred to Canbrika Developments Ltd.

The data for the claims is presented in Table I.

On August 2, 1978 eight units of Kusp 2 claim and eight units of Kusp 4 claim were abandoned. The remaining units of these two claims plus the 20 units of Kusp 1 claim were included in the Kusp Group for assessment work purposes.

SUMMARY OF 1978 FIELD WORK

On June 18 a small camp was established on the lip of the cirque of Kusp Creek (the highly anomalous creek).

Two bleached zones are conspicuous in the drainage area of Kusp Creek (the highly anomalous creek). These are 700 m apart. The western larger one has been labelled Zone 1 and the eastern one has been labelled Zone 2. Most of the geological and all of the geophysical work has concentrated on these two zones and the upper parts of Kusp Creek.

The drainage basin of upper Kusp Creek and the areas extending westward and eastward into adjacent valleys have been mapped by the writer using 20-chain air photographs as a base. The geological data is presented on the same photo base expanded three times to scale 1:5200 (1" = 435'). The 1978 field work was preceded by thin section studies of specimens collected in 1977.

EM 16 work was done by the writer on Zone 1 and Zone 2 and a magnetometer profile was run across Zone 2. Subsequently R. O. Crosby and Associates were contracted to do a Turam survey over a limited area of Zone 1.

The areas of the grid and of the geophysical surveys are very limited and confined largely to the conspicuous bleached horizons. This is because of the extremely rugged nature of the country and the very adverse brush conditions making line cutting and geophysical work very slow and expensive.

TABLE II

GEOCHEMICAL RESULTS

Sample No.	Type	Description	Geochemistry						
			Cu	Pb	Zn	Ag	Au	Sb	As
W 500 R	float	pyritic argillite							
W 501 R	grab	glassy pyritic volcanic							
W 502 R	grab	50' downstream of W 501; highly pyritic limestone 75/90°							
W 503 R	grab	rock with abundant pyrite and pyrrhotite							
W 504 R	grab	pyritic limestone							
W 505 R	grab	black slate interbedded with W 504							
W 506 R	4 m chip	dark gray foliated volcanic and sand cliff							
W 507 R	12 m chip	N of W 506 R; banding at 95°/55° S	48	175	87				
W 508 R	14 m chip	N of W 507 R; same rock	92	720	152				
W 509 R	2 m chip	bleached clay-rich rock, 2 m below helipad	12	75	12				
W 510 R	grab	blocks of dark pyritic rock at helipad	56	32	67				
W 511 R	grab	bleached & gray pyritic rock from o.c. 50' E of helipad	570	1150	800	2.8	20	nd	15
W 512 R	grab	limonite from area of W 511 R	216	730	102	2.7			
W 513 S	grab	soil across 13 m at foot clay-rich slope	206	1070	115	3.0			
T 511 L		silt sample below bleached zone	1380	290	1560	4.4	60	nd	25
T 512 L			2500	750	1900	11.4	100	8	50

Mapping along L 0+20 E, has not indicated any reason for the crest of the Fraser-filtered anomaly on this line. This is possibly because the rock along this line is largely slumped debris which could camouflage any underlying geological features.

As a further commentary on this EM 16 work, one would suspect that the persistent and uniform geological contacts suggested by the interpretation of the EM 16 profiles would indicate that the slide material has not moved very far and that the thickness of the slide material is not great.

CONCLUSIONS

1. Outstanding stream geochemistry (lead, zinc, copper, silver) was obtained in a stream draining Rugged Peak, near the south of Summit Lake.

2. The anomalous metal values are coming from a pyroclastic pile, presumably of Triassic age.

3. The main part of the anomaly comes from a white altered (sericite, clay) zone that appears to be stratigraphically at the top of the pyroclastic pile.

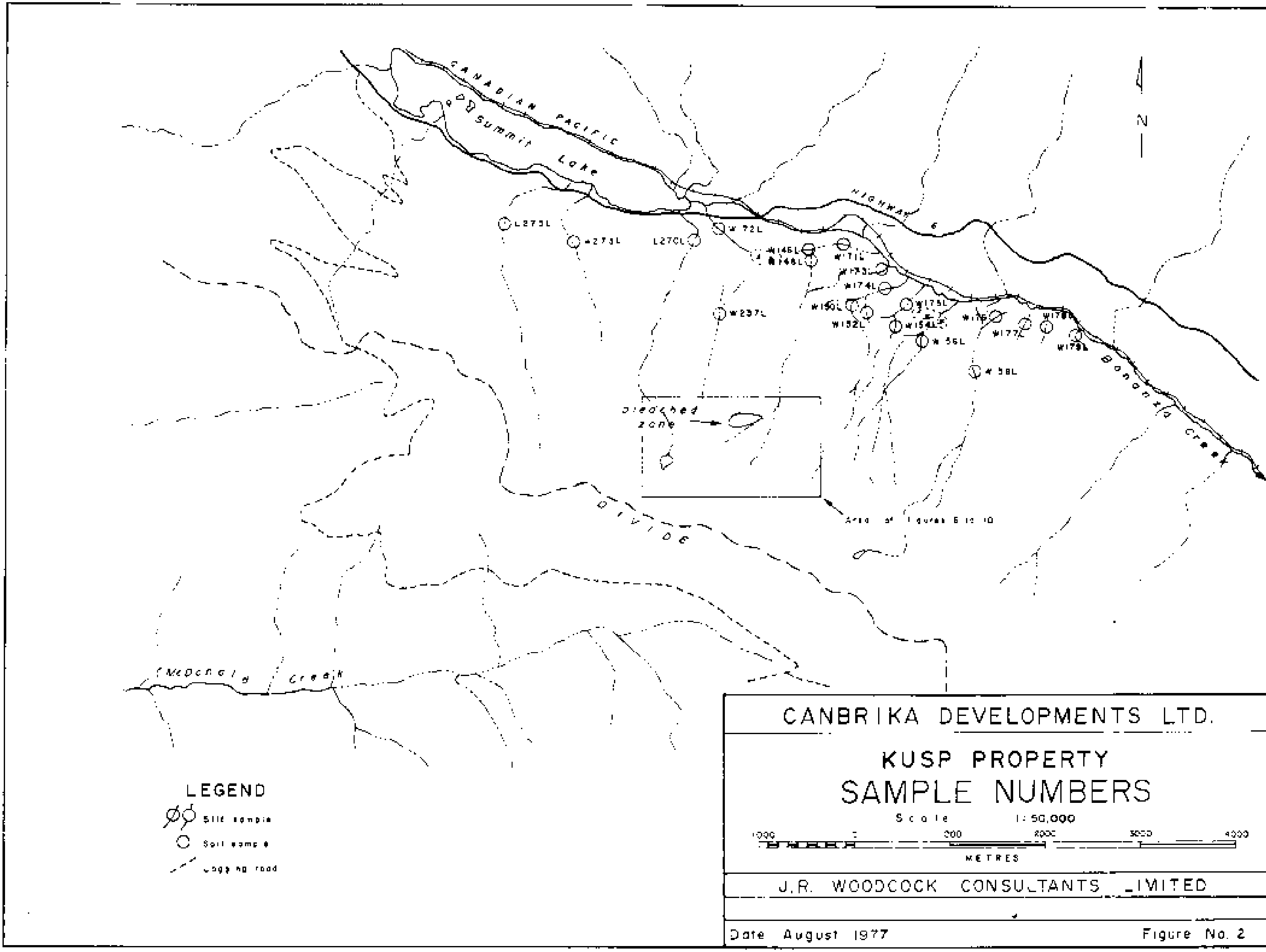
4. This area is complicated by a small rock slide which has moved some of the anomalous rock debris down the hill.

5. A survey using EM 16 helped to indicate three geological contacts and a few conductors, some of which may be caused by conductive acidic water courses.

6. On the basis of the above data, a Turam EM survey was done over Zone 1 (the source of the stream anomaly). This survey has eliminated the "stream anomaly" and detected a broad zone of low conductivity which corresponds with the gray and the white foliated tuffs. Conductors of limited strength occur at the upper and lower contacts of this broad conductive zone. A separate report will be submitted on this aspect of the work by R. O. Crosby.

J. R. Woodcock

J. R. Woodcock
August, 1978



CANBRIKA DEVELOPMENTS LTD.

KUSP PROPERTY

SAMPLE NUMBERS

Scale 1:50,000

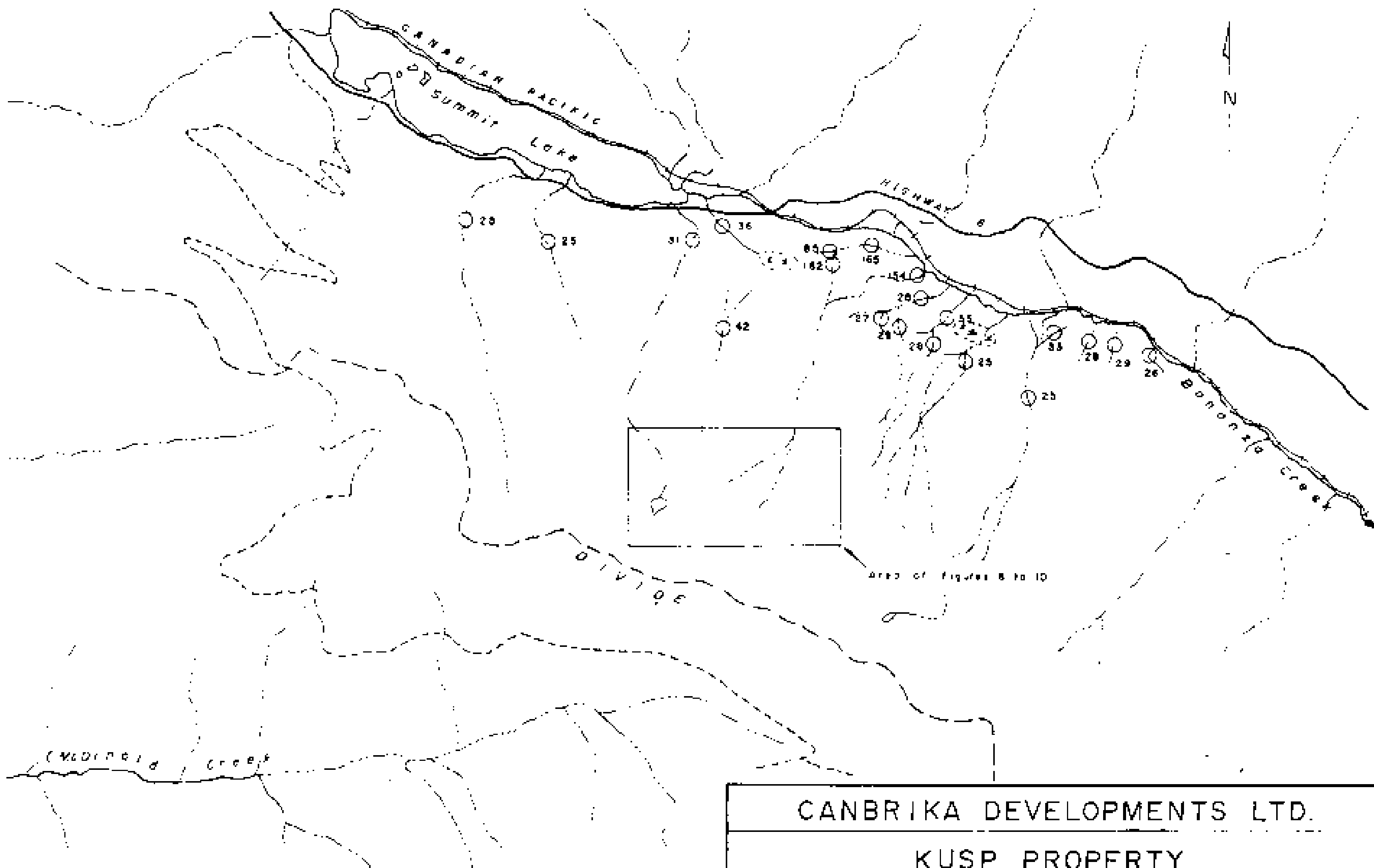
1000 0 1000 2000 3000 4000

METRES

J.R. WOODCOCK CONSULTANTS LIMITED

Date August 1977

Figure No. 2



COLOUR CODE

BACKGROUND ○ 0 — 50 ppm

SLIGHTLY ANOMALOUS ○ 51 — 100 ppm

ANOMALOUS ○ 101 — 200 ppm

HIGHLY ANOMALOUS ○ > 200 ppm

CANBRIKA DEVELOPMENTS LTD.

KUSP PROPERTY

LEAD IN SILT

Scale 1:50,000

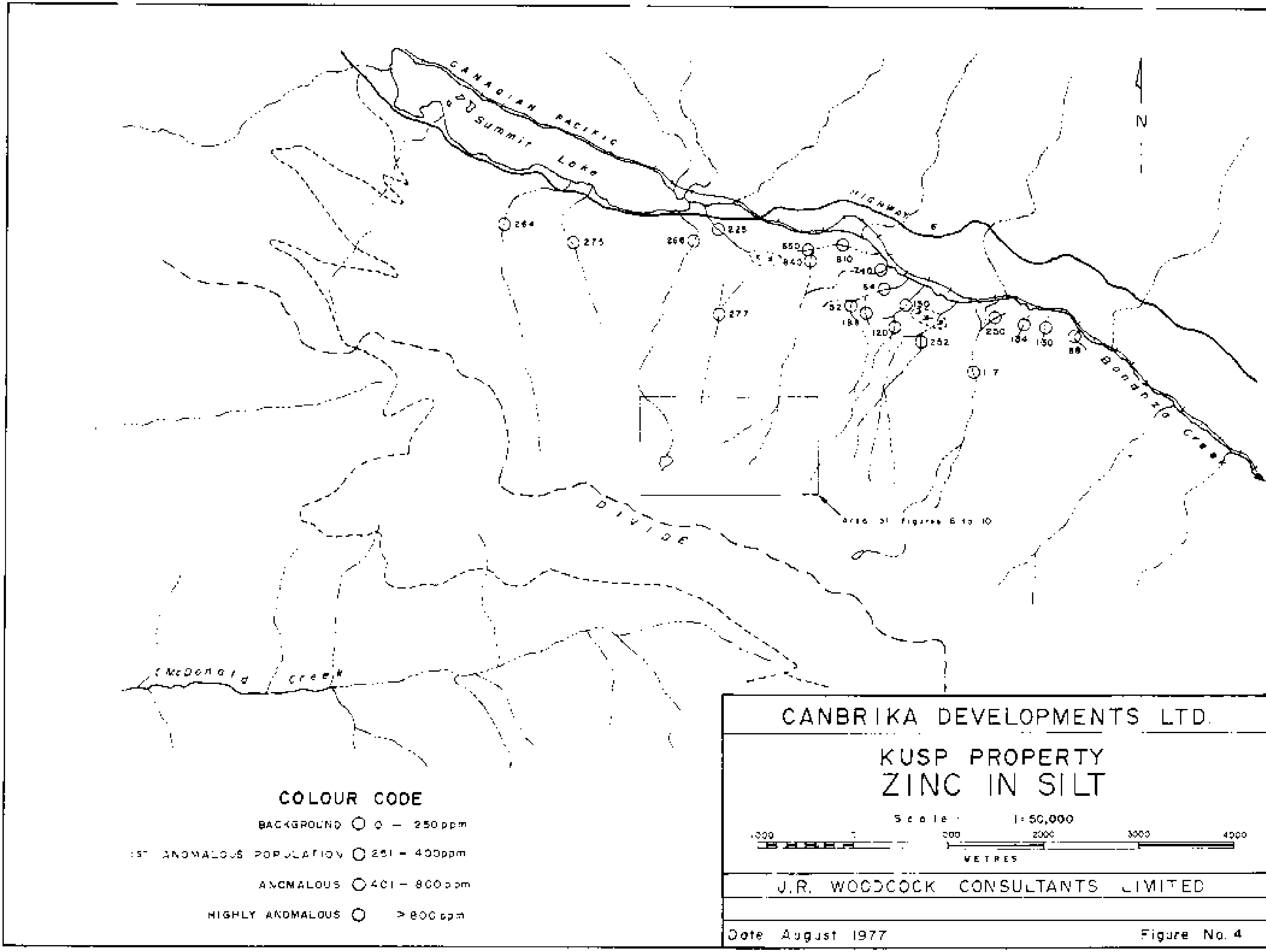
1000 0 1000 2000 3000 4000

METRES

J.R. WOODCOCK CONSULTANTS LIMITED

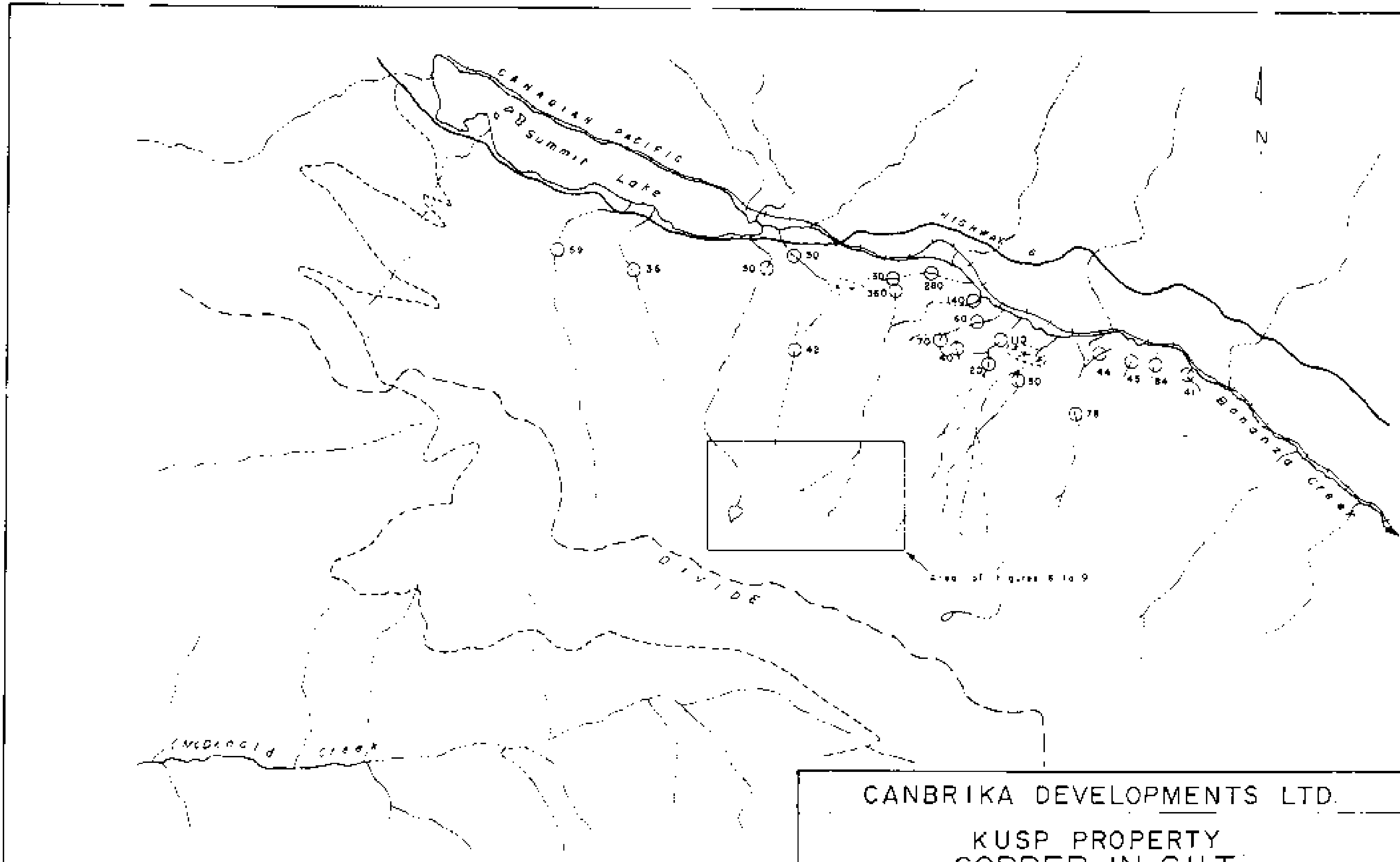
Date August 1977

Figure No. 3



CANADIAN PACIFIC
Summit Lake
HIGHWAY 6
N
264
275
266
225
650
840
810
240
54
52
188
120
150
252
250
184
150
88
117
277
Bonanza Creek
Area of figures 6 to 10
DIVIDE
McDonald Creek
COLOUR CODE
BACKGROUND 0 – 250 ppm
1ST ANOMALOUS POPULATION 251 – 400 ppm
ANOMALOUS 401 – 800 ppm
HIGHLY ANOMALOUS > 800 ppm
CANBRIKA DEVELOPMENTS LTD.
KUSP PROPERTY
ZINC IN SILT
Scale : 1:50,000
METRES
J.R. WOODCOCK CONSULTANTS LIMITED
Date August 1977
Figure No. 4

12



COLOUR CODE

BACKGROUND ○ 0 - 70 ppm

1st ANOMALOUS POPULATION ○ 71 - 120ppm

ANOMALOUS ○ 121 - 250ppm

HIGHLY ANOMALOUS ○ >250ppm

CANBRIKA DEVELOPMENTS LTD.

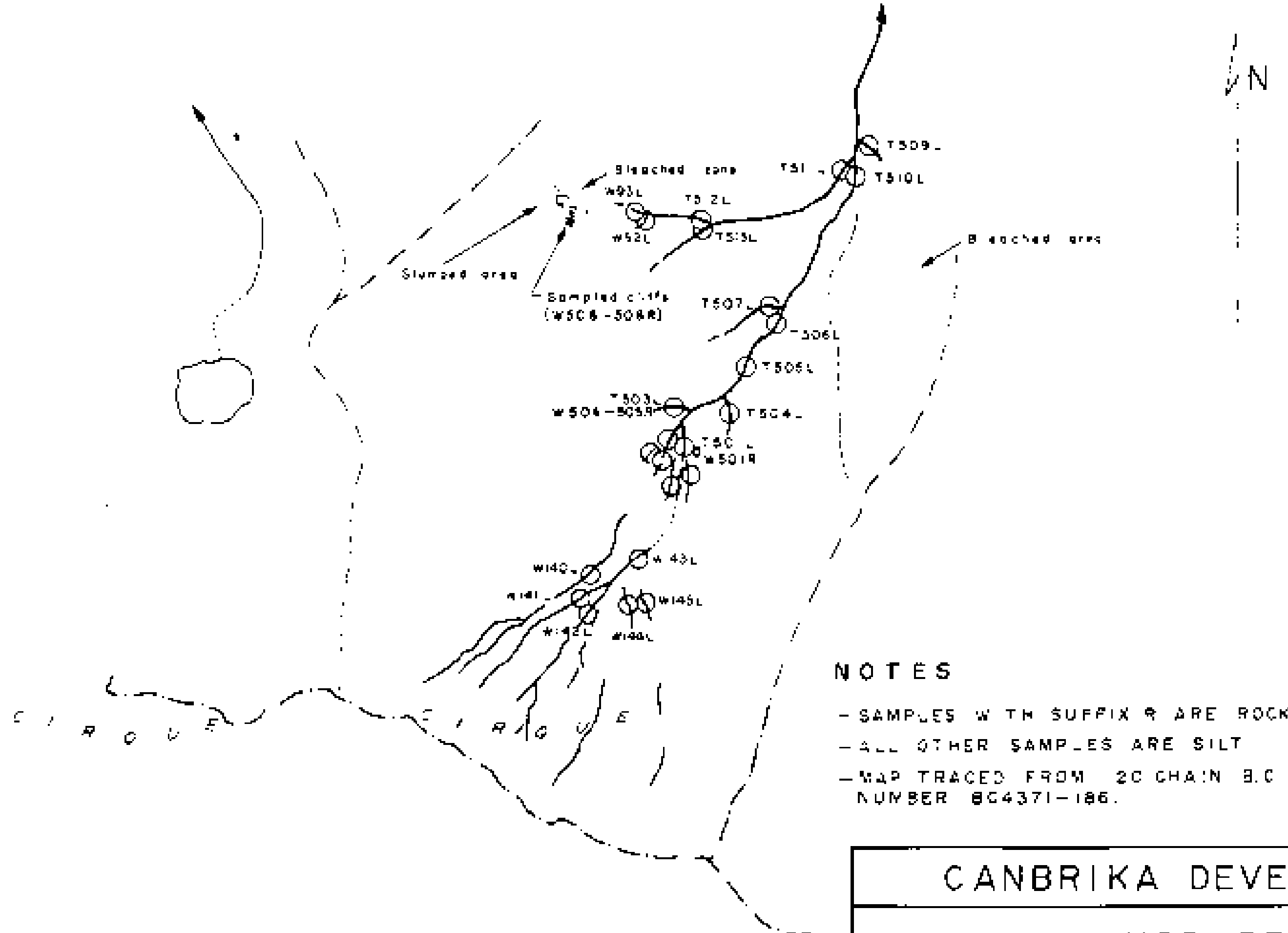
KUSP PROPERTY
COPPER IN SILT

Scale 1:50,000

METRES

J.R. WOODCOCK CONSULTANTS LIMITED

Date August 1977 | Figure No. 5



NOTES

- SAMPLES WITH SUFFIX R ARE ROCK SAMPLES
- ALL OTHER SAMPLES ARE SILT
- MAP TRACED FROM 20 CHAIN B.C. A.R. PHOTO NUMBER BC4371-186.

LEGEND

SILT SAMPLE

CREST OF INTERFLUVE

HELICOPTER PAD

W92,93,140-148 FROM 1978

CANBRIKA DEVELOPMENTS LTD.

KUSP PROPERTY

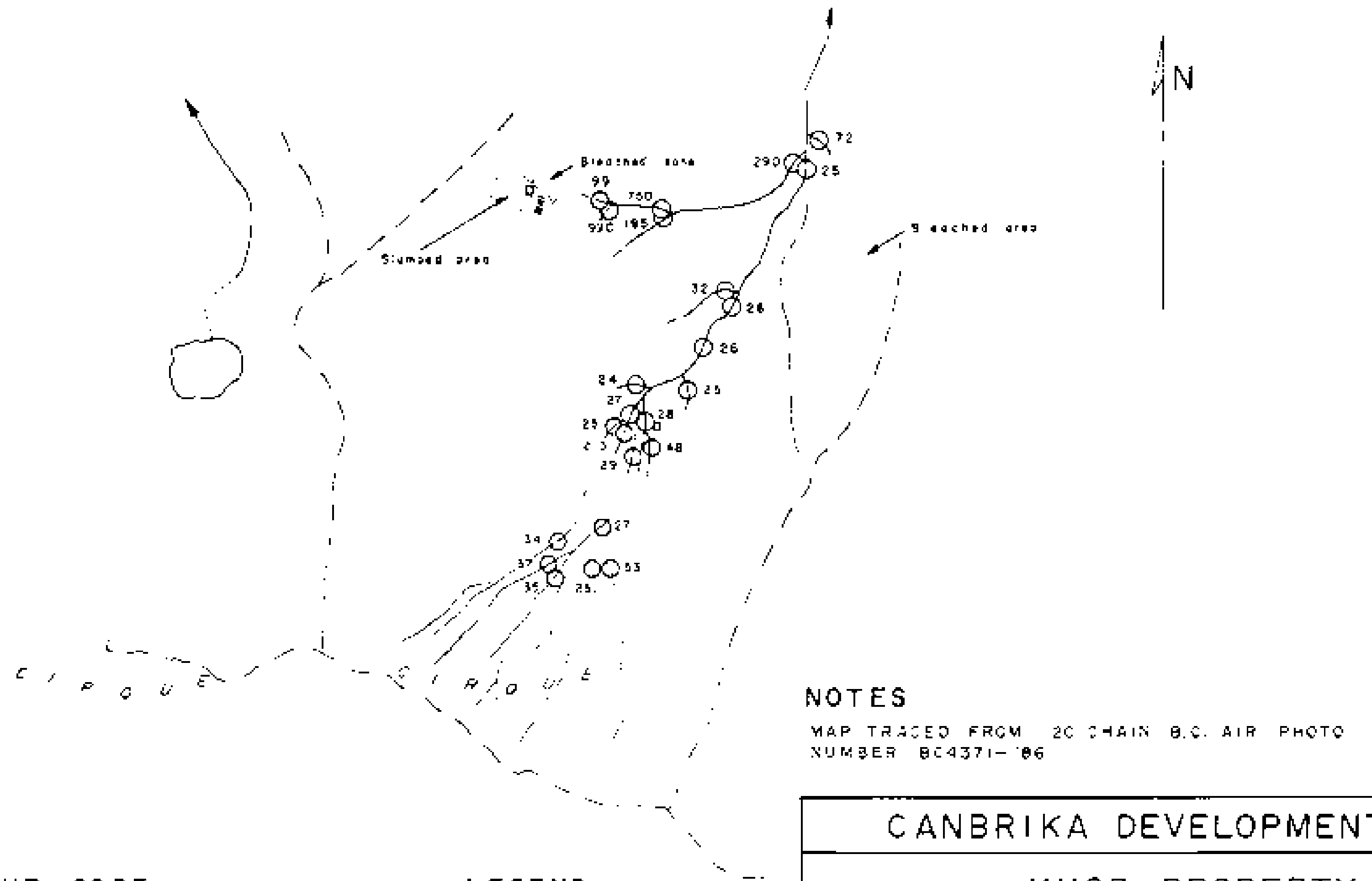
SAMPLE NUMBERS

Scale 0 200 400 600 800 1000 METRES

J.R. WOODCOCK CONSULTANTS LIMITED

Date July 1978

Figure No 6



NOTES

MAP TRACED FROM 20 CHAIN B.C. AIR PHOTO
NUMBER BC4371-186

COLOUR CODE

BACKGROUND ○ 0 - 50 ppm
SLIGHLY ANOMALOUS ○ 51 - 100 ppm
ANOMALOUS ○ 101 - 200 ppm
HIGHLY ANOMALOUS ○ > 200 ppm

LEGEND

SILT SAMPLE
CREST OF INTERFLUVE
HELICOPTER PAD

CANBRIKA DEVELOPMENTS LTD.

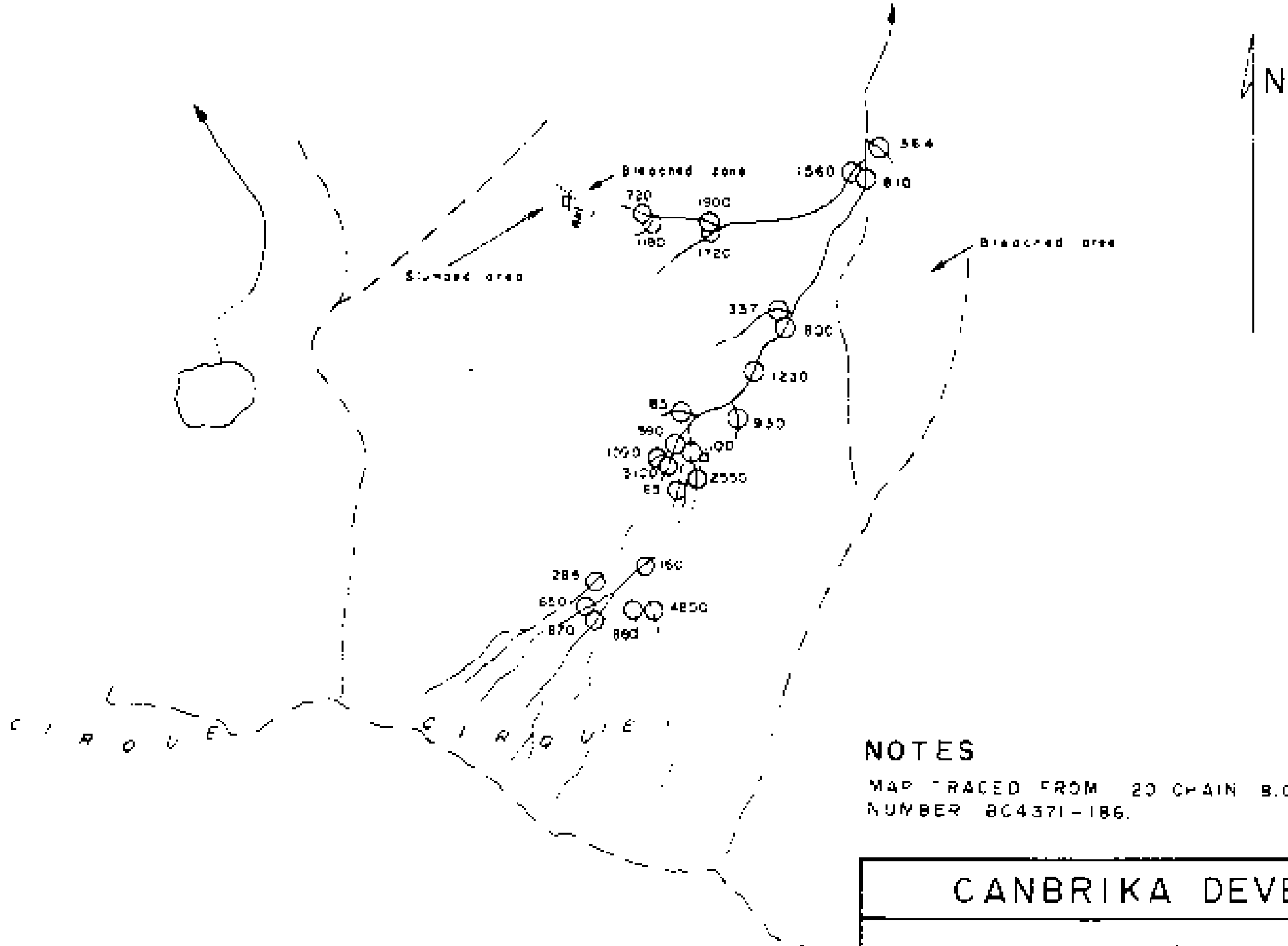
KUSP PROPERTY

LEAD IN SILT

Scale
0 200 400 600 800 1000
METRES

J.R. WOODCOCK CONSULTANTS LIMITED

Date July 1978 Figure No. 7



NOTES

MAP TRACED FROM 20 CHAIN B.C. AIR PHOTO NUMBER BC4371-186.

COLOUR CODE

BACKGROUND ○ 0 - 250 ppm

(3) ANOMALOUS POPULATION ○ 251 - 400 ppm

ANOMALOUS ○ 401 - 800 ppm

HIGHLY ANOMALOUS ○ > 800 ppm

LEGEND

SILT SAMPLE

CREST OF INTERFLUVE

HELICOPTER PAD

CANBRIKA DEVELOPMENTS LTD.

KUSP PROPERTY

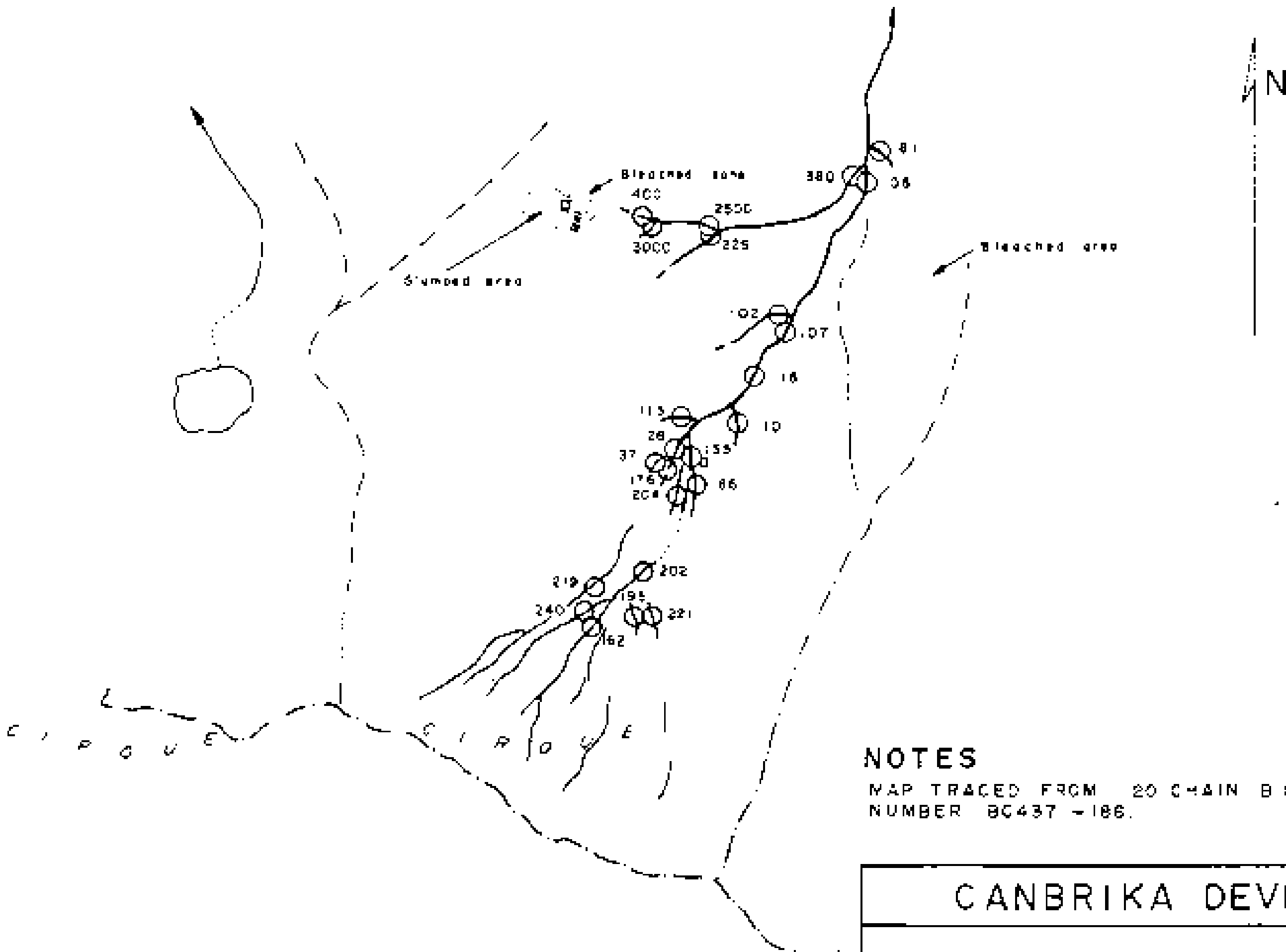
ZINC IN SILT

0 200 400 600 800 1000

METRES

J.R. WOODCOCK CONSULTANTS LIMITED

Date July 1978 | Figure No. 8



NOTES
MAP TRACED FROM 20 CHAIN B.C. AIR PHOTO
NUMBER BC437 - 186.

COLOUR CODE

BACKGROUND ○ 0 - 70 ppm

1ST ANOMALOUS POPULATION ○ 71 - 120 ppm

ANOMALOUS ○ 121 - 250 ppm

HIGHLY ANOMALOUS ○ > 250 ppm

LEGEND

SILT SAMPLE

CREST OF INTERFLUVE

HELICOPTER PAD

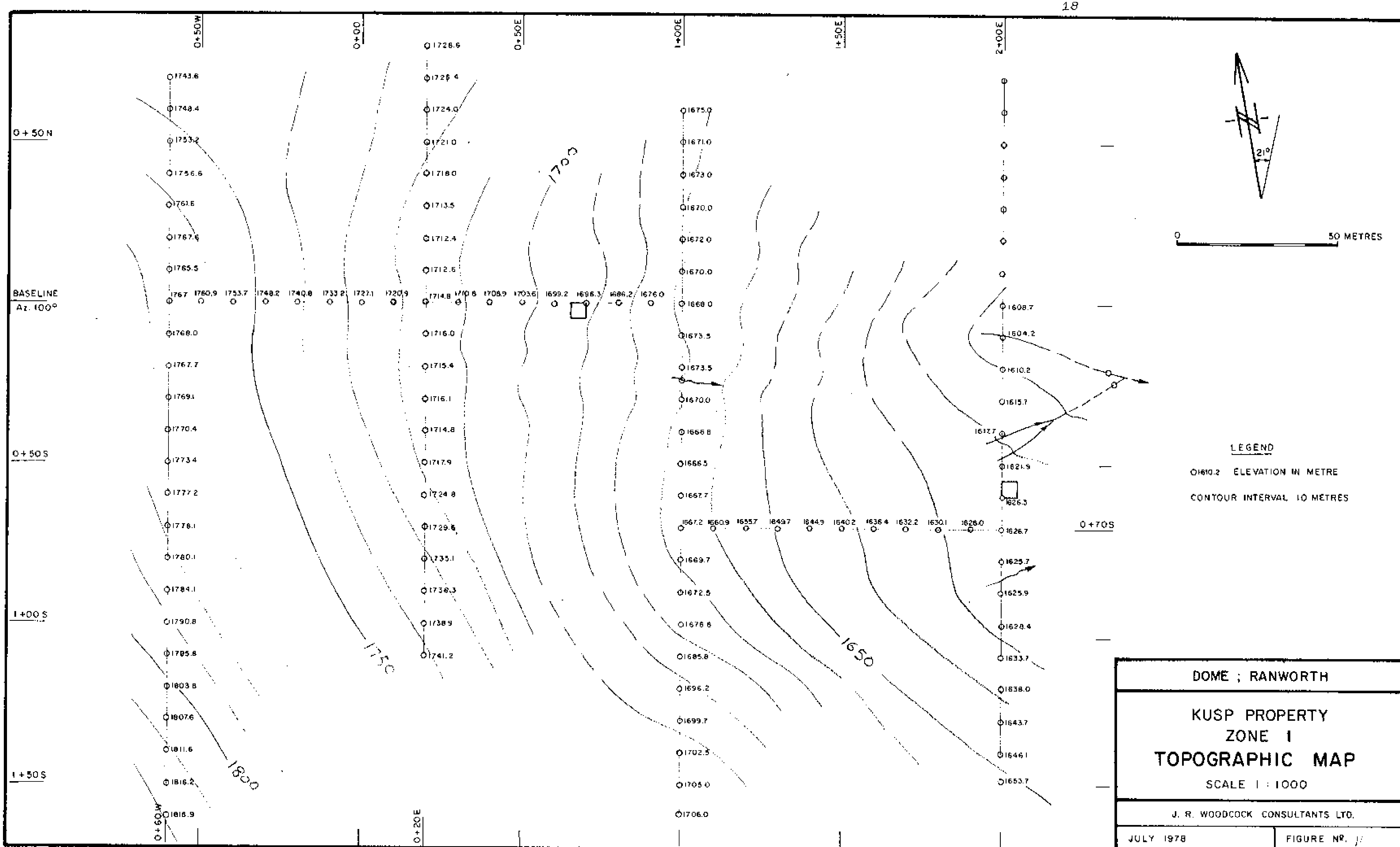
CANBRIKA DEVELOPMENTS LTD.

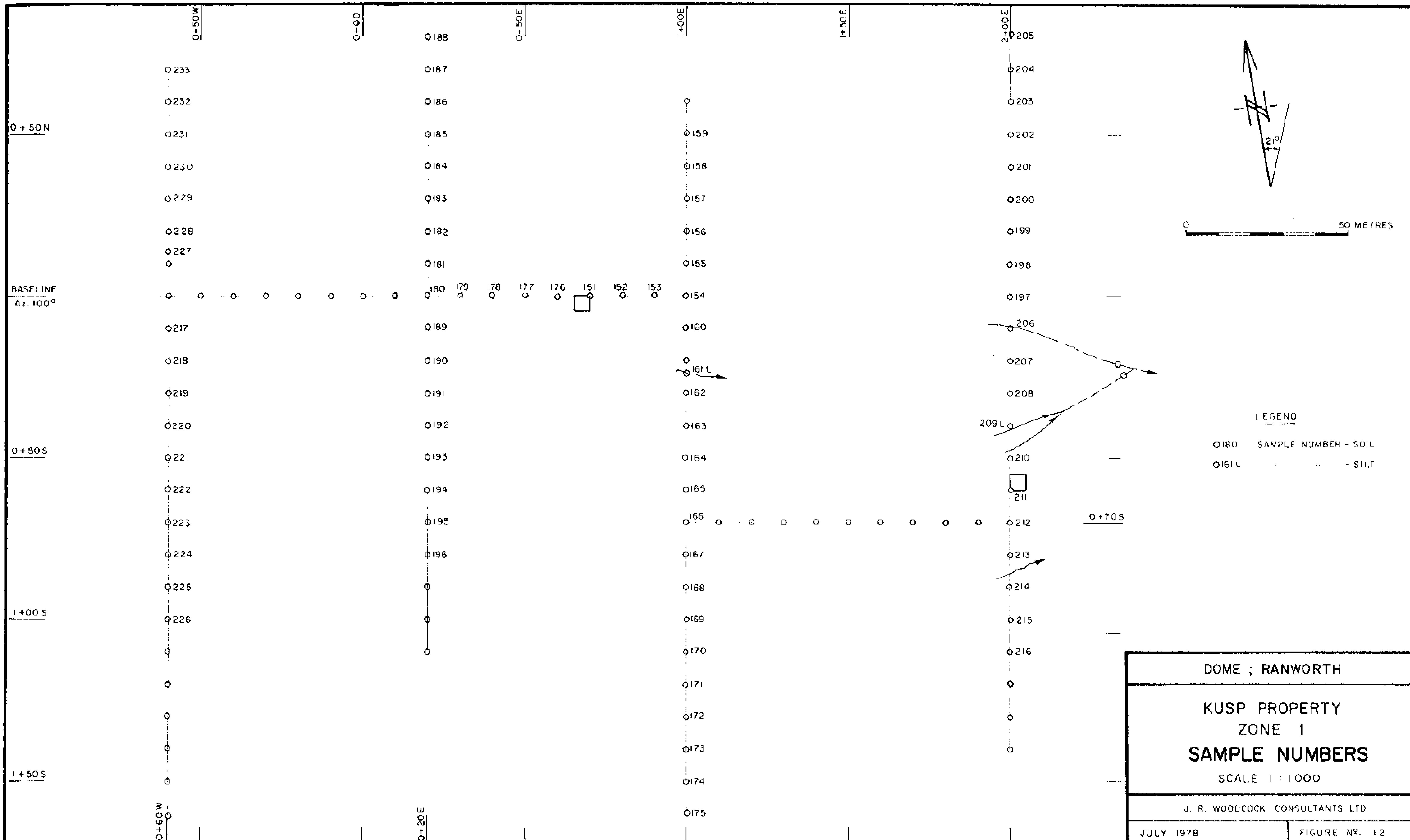
KUSP PROPERTY
COPPER IN SILT

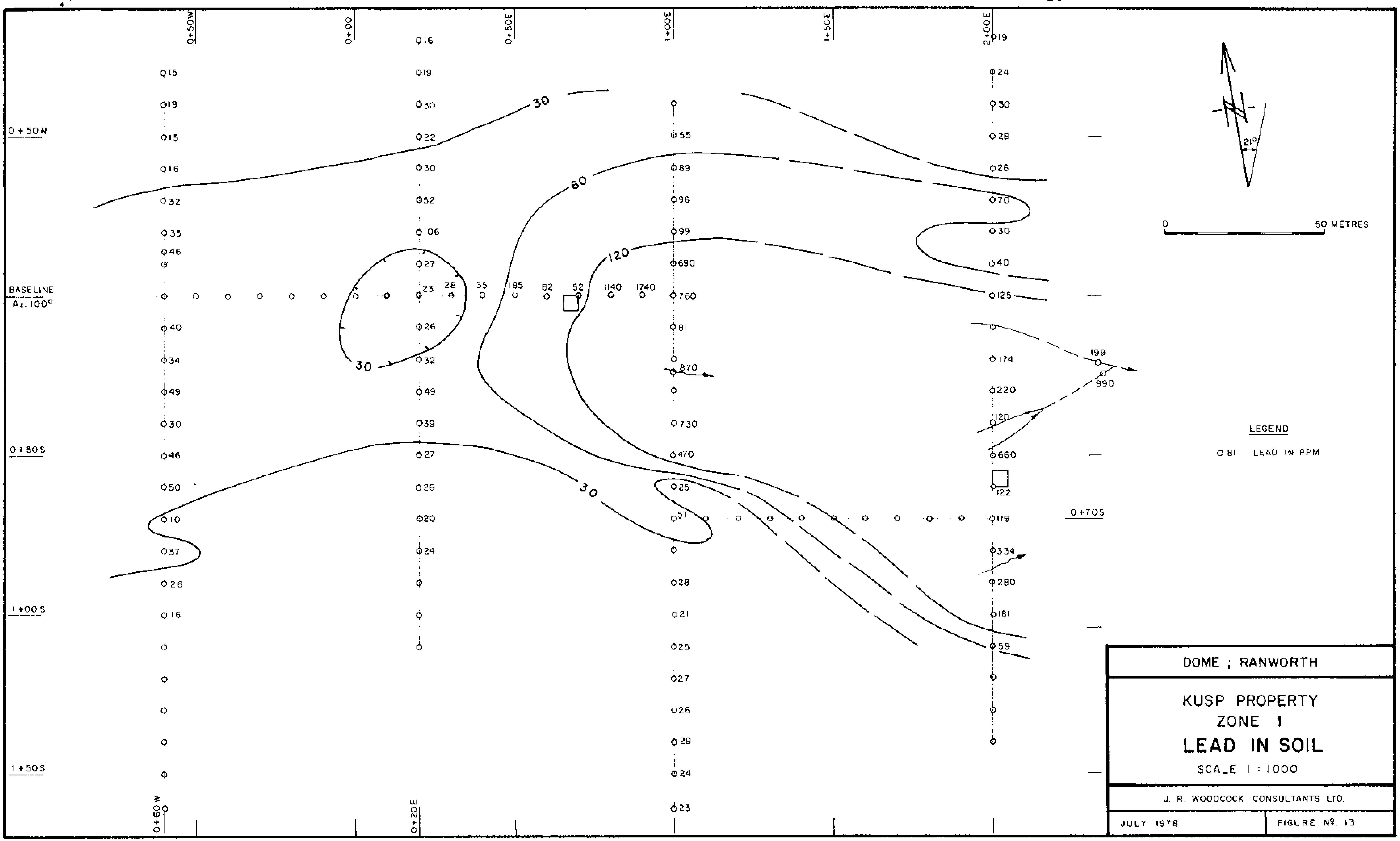
Scale
0 200 400 600 800 1000
METRES

J.R. WOODCOCK CONSULTANTS LIMITED

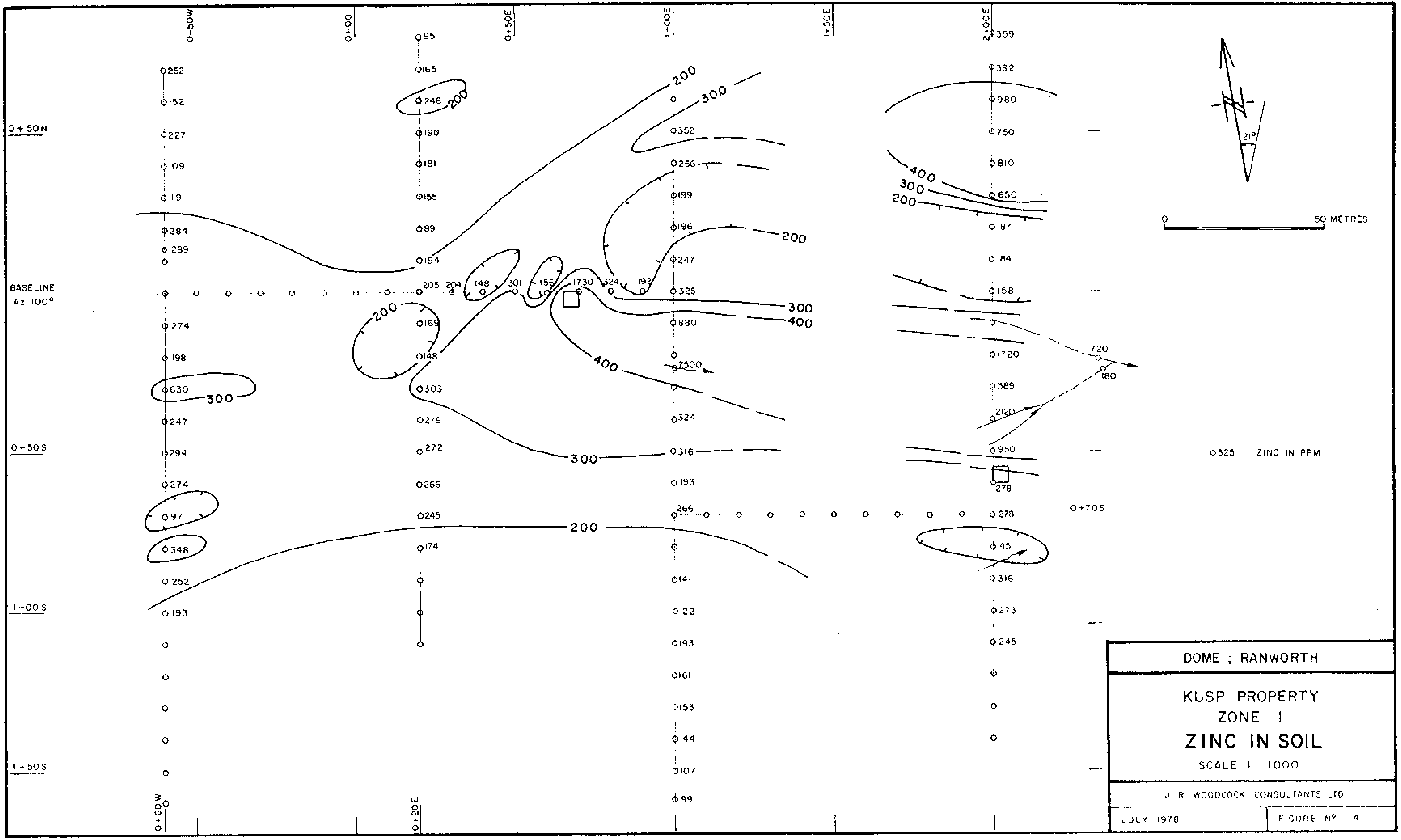
Date July 1978 Figure No 9

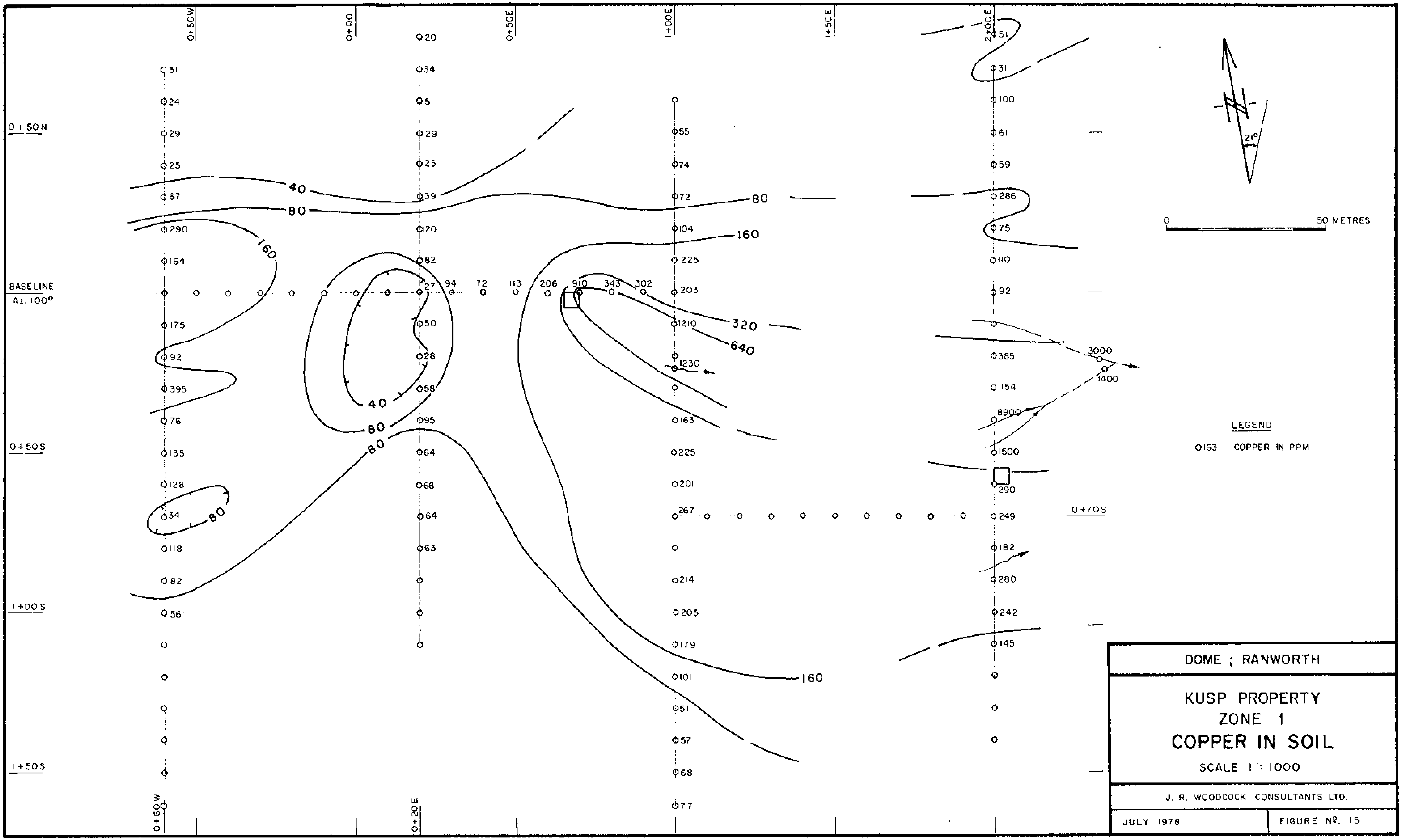

0+50W
0+00
0+50E
1+00E
1+50E
2+00E
0+50N
BASELINE
Az. 100°
0+50S
1+00S
1+50S
0+70S
0+60W
0+20E
1700
1750
1800
1650
21°
0
50 METRES
LEGEND
O1610.2 ELEVATION IN METRE
CONTOUR INTERVAL 10 METRES
DOME ; RANWORTH
KUSP PROPERTY
ZONE 1
TOPOGRAPHIC MAP
SCALE 1 : 1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº.


0+50W
0+00
0+50E
1+00E
1+50E
2+00E
0+50N
BASELINE
Az. 100°
0+50S
1+00S
1+50S
0+70S
0+60W
0+20E
188
187
186
185
184
183
182
181
180
179
178
177
176
151
152
153
154
155
156
157
158
159
160
161L
162
163
164
165
166
167
168
169
170
171
172
173
174
175
189
190
191
192
193
194
195
196
205
204
203
202
201
200
199
198
197
206
207
208
209L
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
21°
0
50 METRES
LEGEND
0180 SAMPLE NUMBER - SOIL
0161L " " - SILT
DOME ; RANWORTH
KUSP PROPERTY
ZONE 1
SAMPLE NUMBERS
SCALE 1 : 1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 12

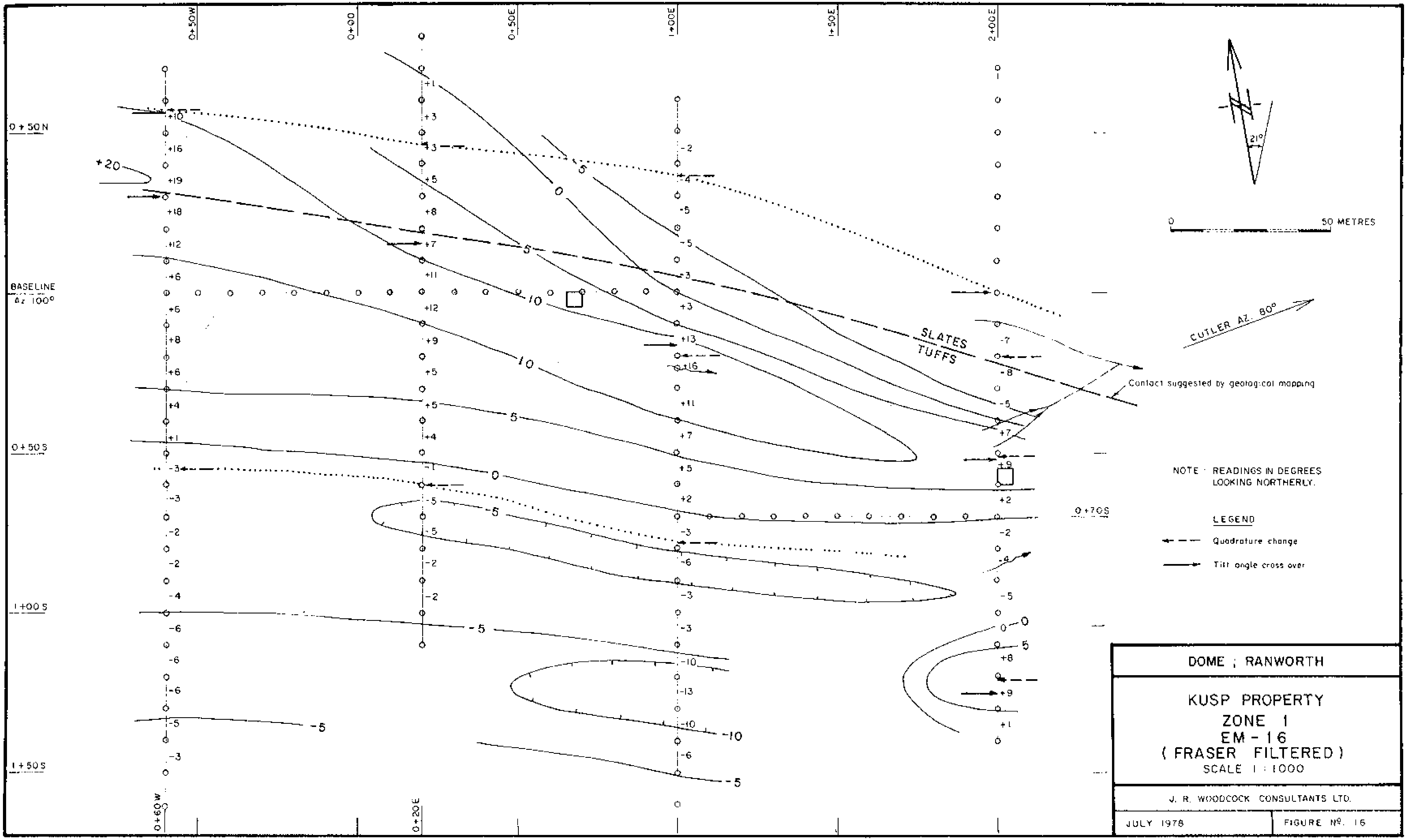


DOME ; RANWORTH
KUSP PROPERTY
ZONE 1
LEAD IN SOIL
SCALE 1 : 1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 13
LEGEND
O 81 LEAD IN PPM
0
50 METRES
21°
BASELINE
Az. 100°
0+50N
0+50S
1+00S
1+50S
0+70S
0+50W
0+00
0+50E
1+00E
1+50E
2+00E
0+60W
0+20E
30
60
120

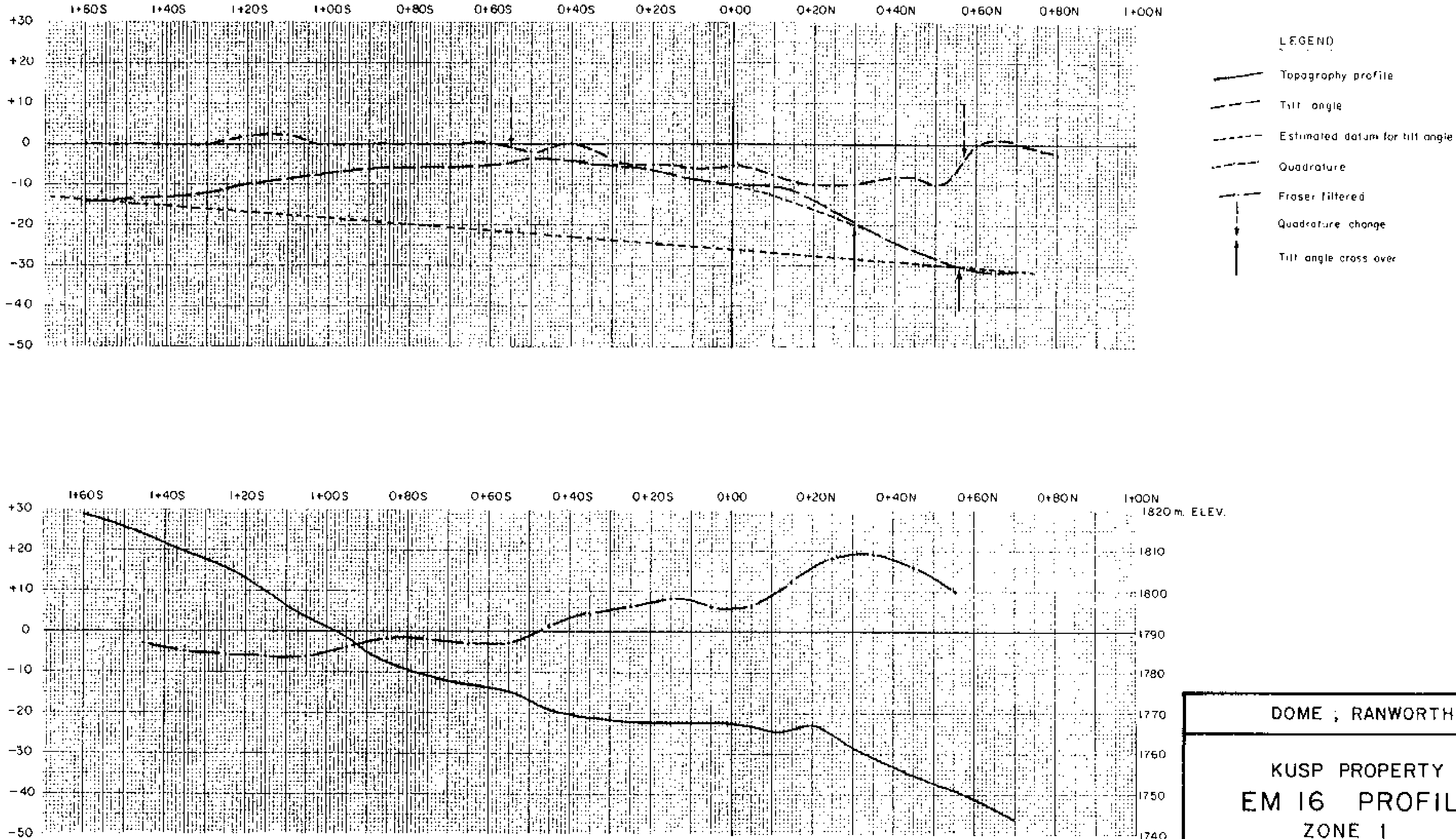

DOME ; RANWORTH
KUSP PROPERTY
ZONE 1
ZINC IN SOIL
SCALE 1 : 1000
J. R. WOODCOCK CONSULTANTS LTD
JULY 1978
FIGURE Nº 14
o325 ZINC IN PPM
0 50 METRES
21°
BASELINE
Az. 100°
0+50N
0+50S
1+00S
1+50S
0+70S
0+50W
0+00
0+50E
1+00E
1+50E
2+00E
0+60W
0+20E
200
300
400



0+50W
0+00
0+50E
1+00E
1+50E
2+00E
0+50N
BASELINE
Az. 100°
0+50S
1+00S
1+50S
0+70S
0+60W
0+20E
40
80
160
320
640
20
34
51
29
25
39
120
82
27
94
72
113
206
910
343
302
31
24
67
290
164
175
92
395
76
135
128
34
118
82
56
50
28
58
95
64
68
64
63
55
74
72
104
225
203
1210
1230
163
225
201
267
214
205
179
101
51
57
68
77
100
61
59
286
75
110
385
154
8900
1500
290
249
182
280
242
145
3000
1400
21°
0
50 METRES
LEGEND
O163 COPPER IN PPM
DOME ; RANWORTH
KUSP PROPERTY
ZONE 1
COPPER IN SOIL
SCALE 1 : 1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 15



0+50W
0+00
0+50E
1+00E
1+50E
2+00E
0+50N
BASELINE Az 100°
0+50S
0+70S
1+00S
1+50S
0+60W
0+20E
SLATES
TUFFS
CUTLER AZ. 80°
Contact suggested by geological mapping
21°
0
50 METRES
NOTE : READINGS IN DEGREES LOOKING NORTHERLY.
LEGEND
Quadrature change
Tilt angle cross over
DOME ; RANWORTH
KUSP PROPERTY
ZONE 1
EM - 16
(FRASER FILTERED)
SCALE 1 : 1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 16



DOME ; RANWORTH

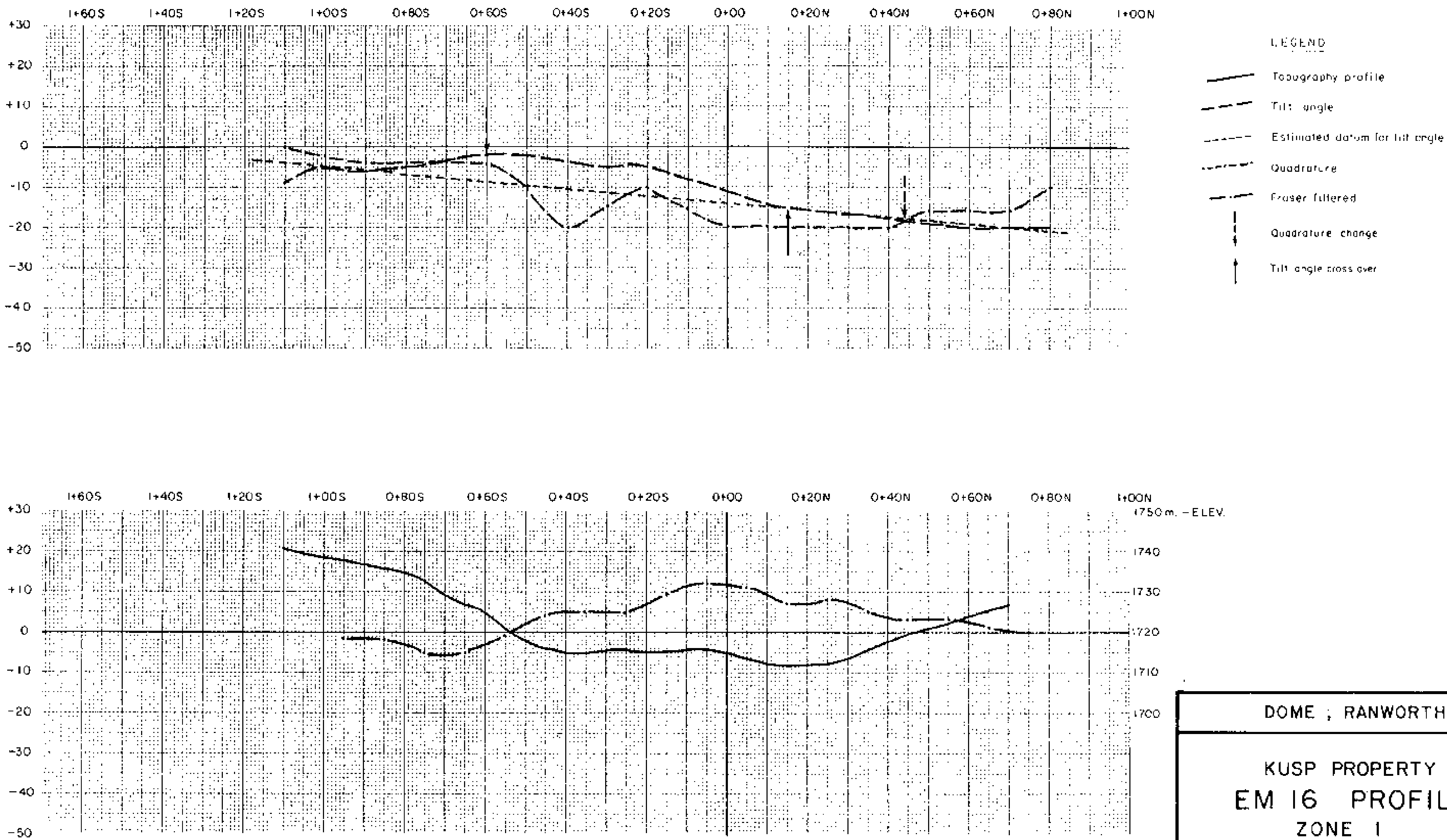
KUSP PROPERTY

EM 16 PROFILE

ZONE 1
LINE 0+60W

J. R. WOODCOCK CONSULTANTS LTD

JULY 1978 | FIGURE Nº. 17



DOME ; RANWORTH

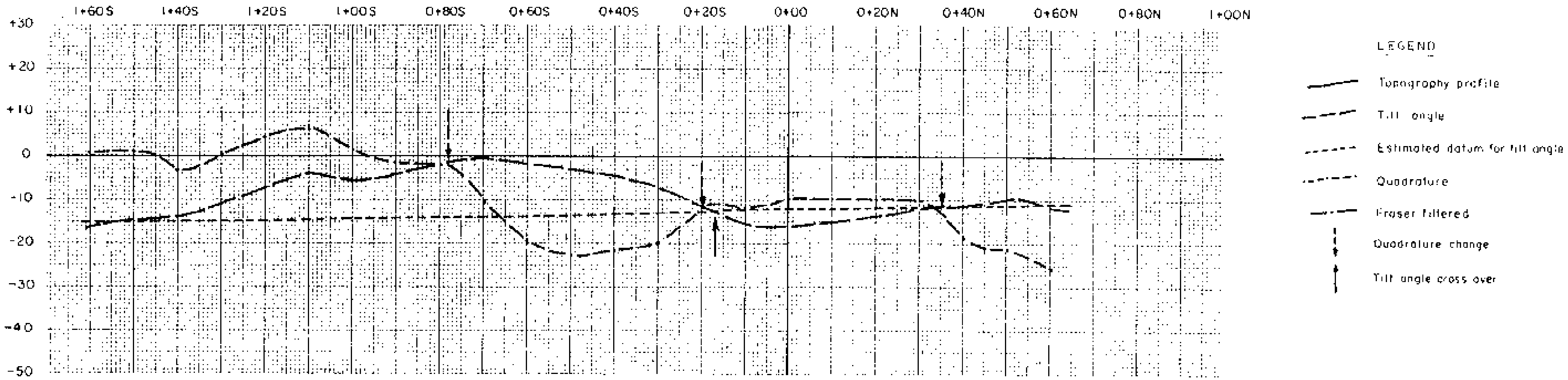
KUSP PROPERTY

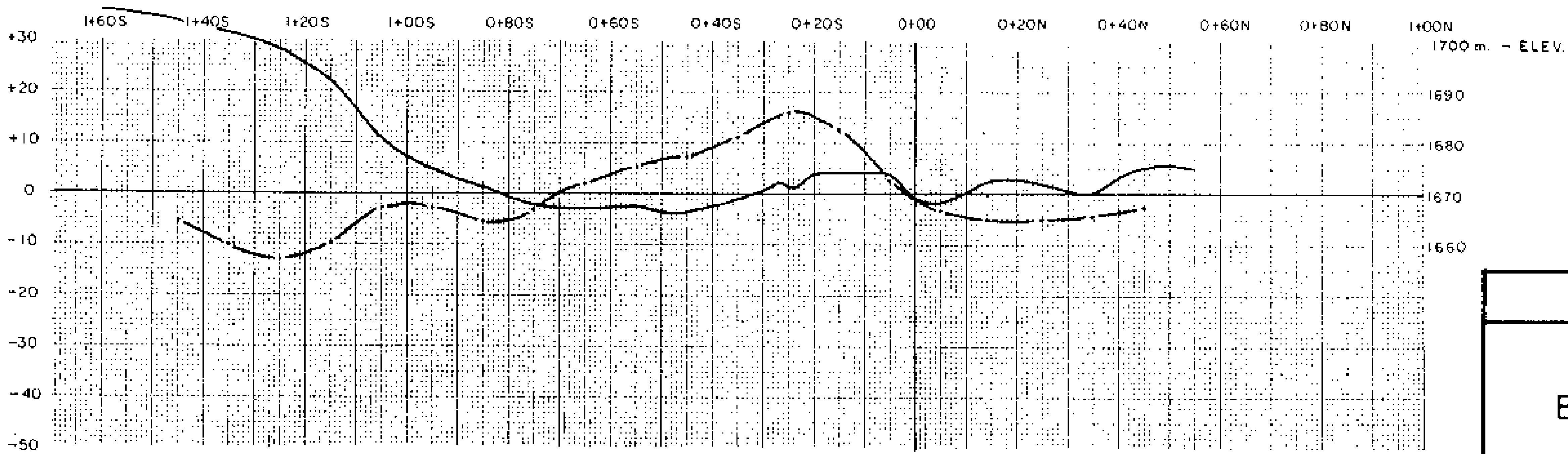
EM 16 PROFILE

ZONE 1
LINE 0+20

J. R. WOODCOCK CONSULTANTS LTD

JULY 1978	FIGURE Nº. 18





DOME ; RANWORTH

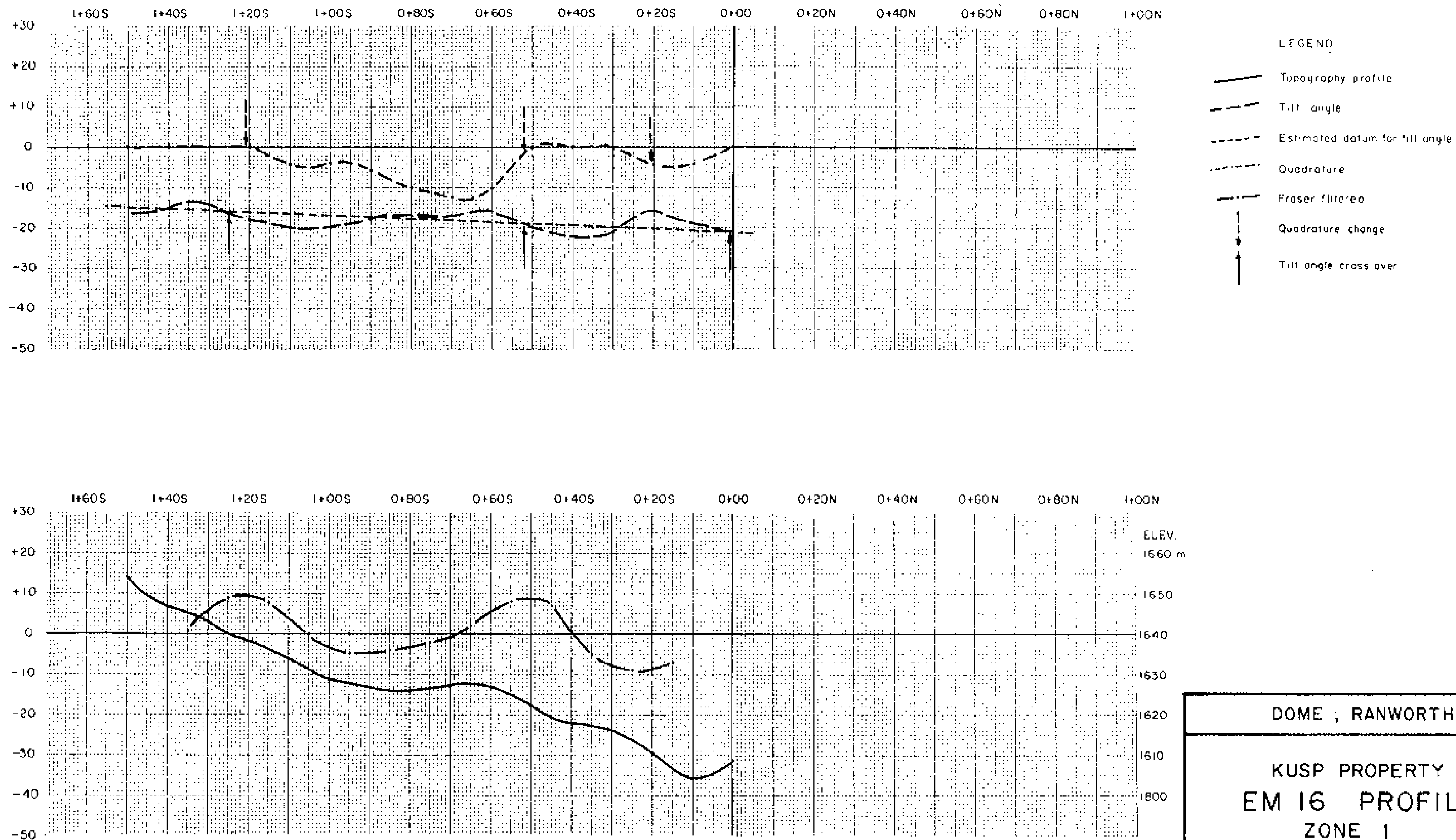
KUSP PROPERTY

EM 16 PROFILE

ZONE 1
LINE 1+00E

J. R. WOODCOCK CONSULTANTS LTD

JULY 1978 | FIGURE Nº. 19

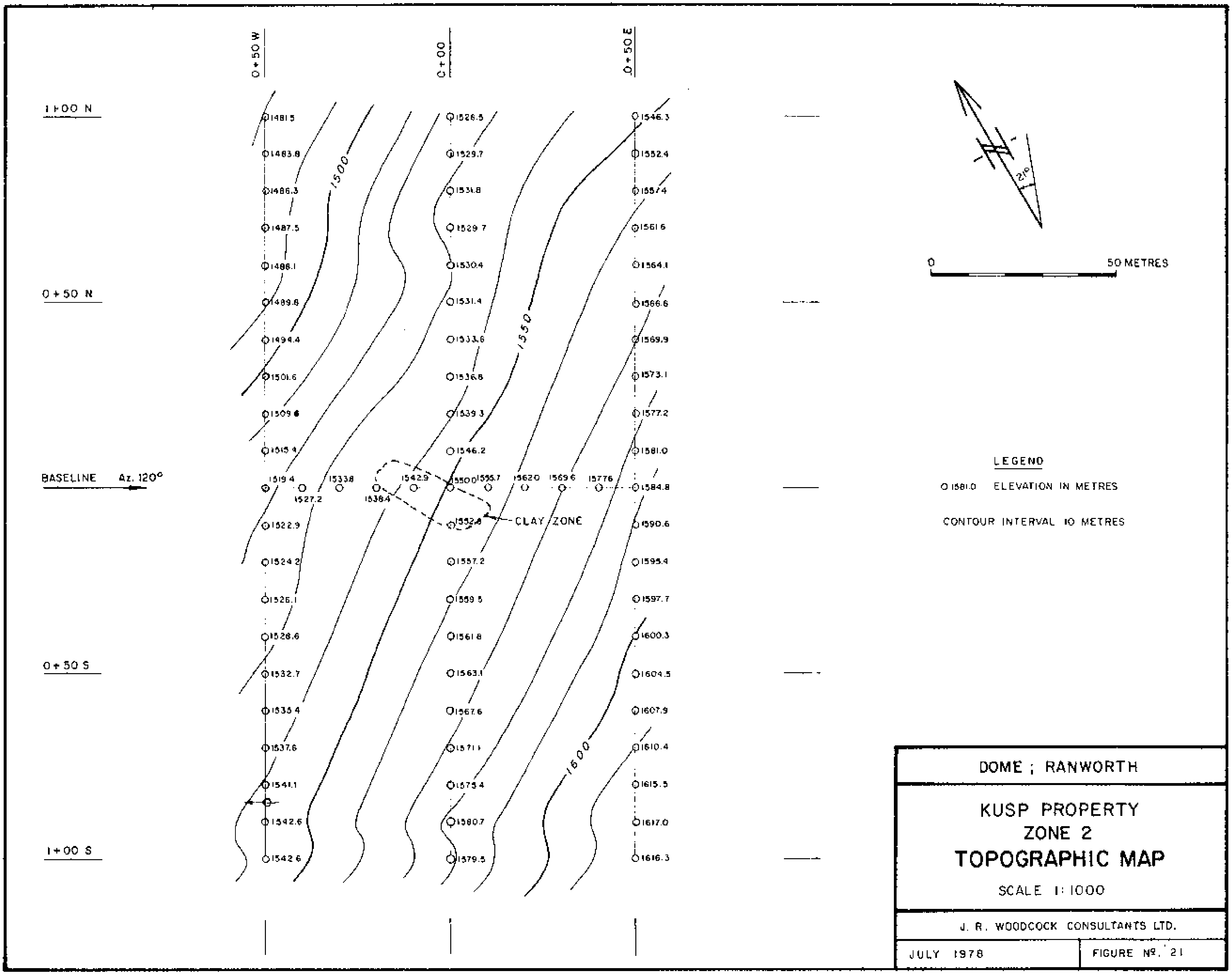


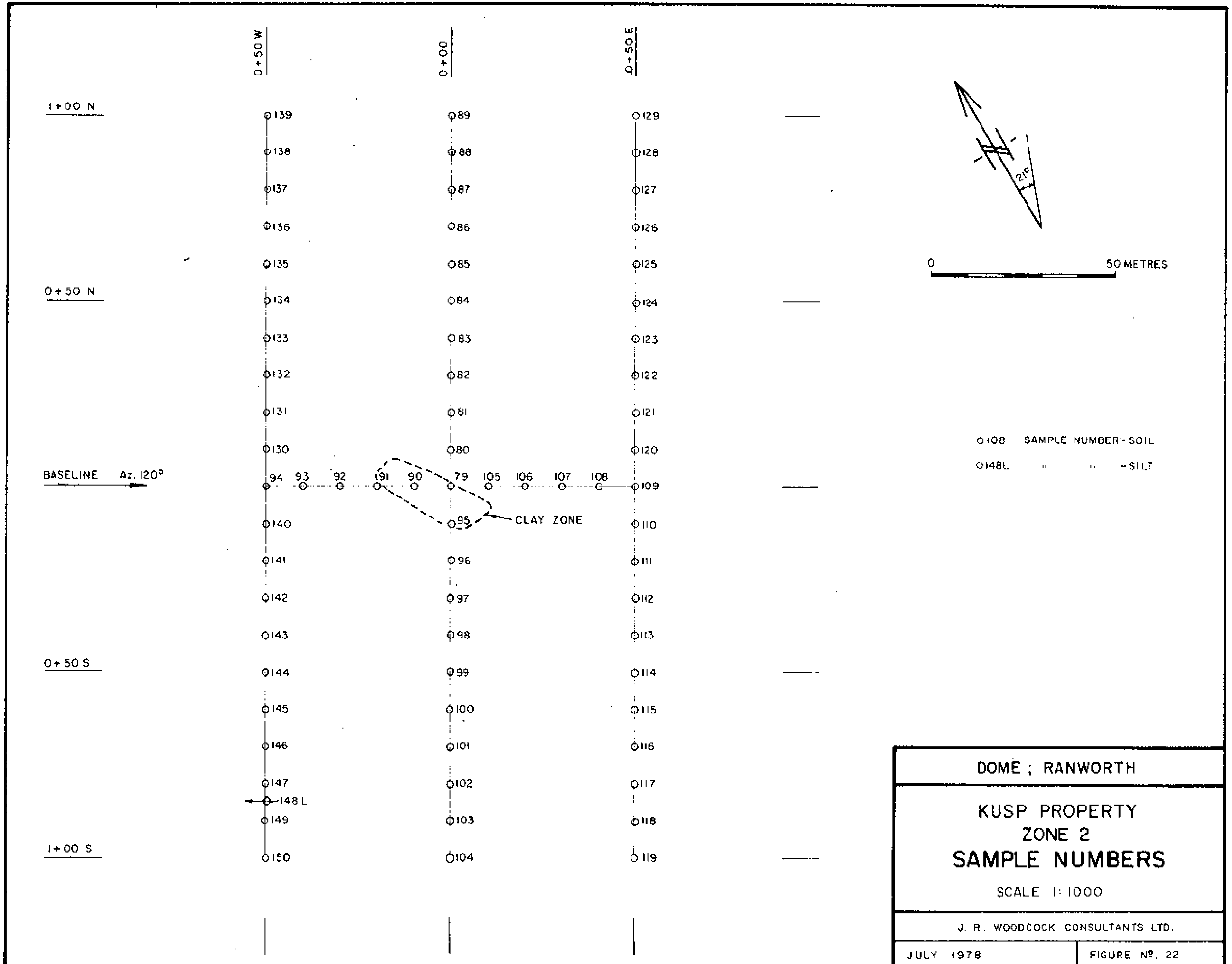
DOME ; RANWORTH

KUSP PROPERTY
EM 16 PROFILE
ZONE 1
LINE 2+00E

J. R. WOODCOCK CONSULTANTS LTD.

JULY 1978 | FIGURE Nº 20


0+50 W
0+00
0+50 E
1+00 N
0+50 N
BASELINE Az. 120°
0+50 S
1+00 S
1500
1550
1600
CLAY ZONE
1481.5
1483.8
1486.3
1487.5
1488.1
1489.8
1494.4
1501.6
1509.6
1515.4
1519.4
1527.2
1533.8
1538.4
1542.9
1550.0
1555.7
1562.0
1569.6
1577.6
1584.8
1522.9
1524.2
1526.1
1528.6
1532.7
1535.4
1537.6
1541.1
1542.6
1542.6
1526.5
1529.7
1531.8
1529.7
1530.4
1531.4
1533.6
1536.8
1539.3
1546.2
1552.8
1557.2
1559.5
1561.8
1563.1
1567.6
1571.1
1575.4
1580.7
1579.5
1546.3
1552.4
1557.4
1561.6
1564.1
1566.6
1569.9
1573.1
1577.2
1581.0
1590.6
1595.4
1597.7
1600.3
1604.5
1607.9
1610.4
1615.5
1617.0
1616.3
21°
0
50 METRES
LEGEND
O 1581.0 ELEVATION IN METRES
CONTOUR INTERVAL 10 METRES
DOME ; RANWORTH
KUSP PROPERTY
ZONE 2
TOPOGRAPHIC MAP
SCALE 1:1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 21



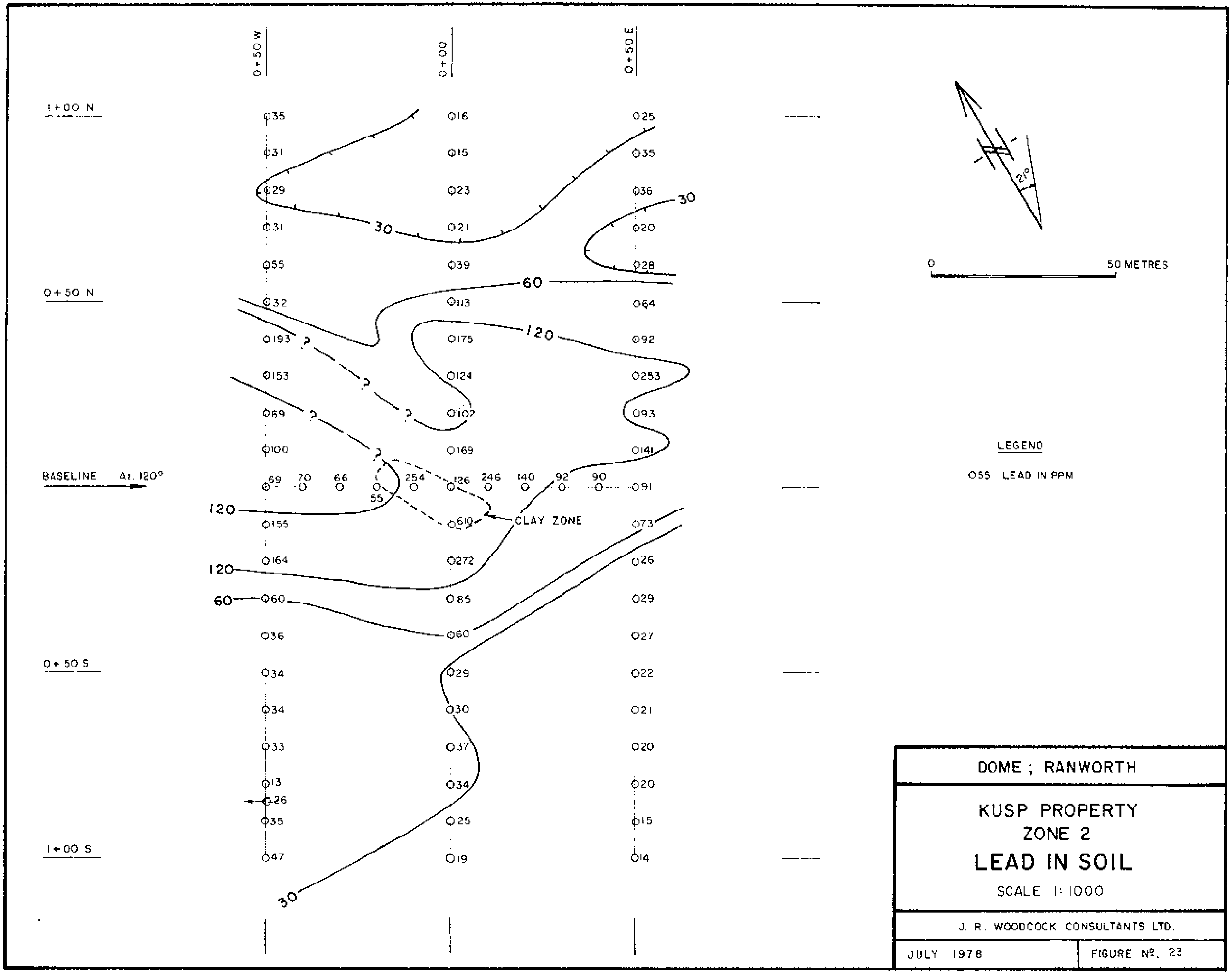
DOME ; RANWORTH

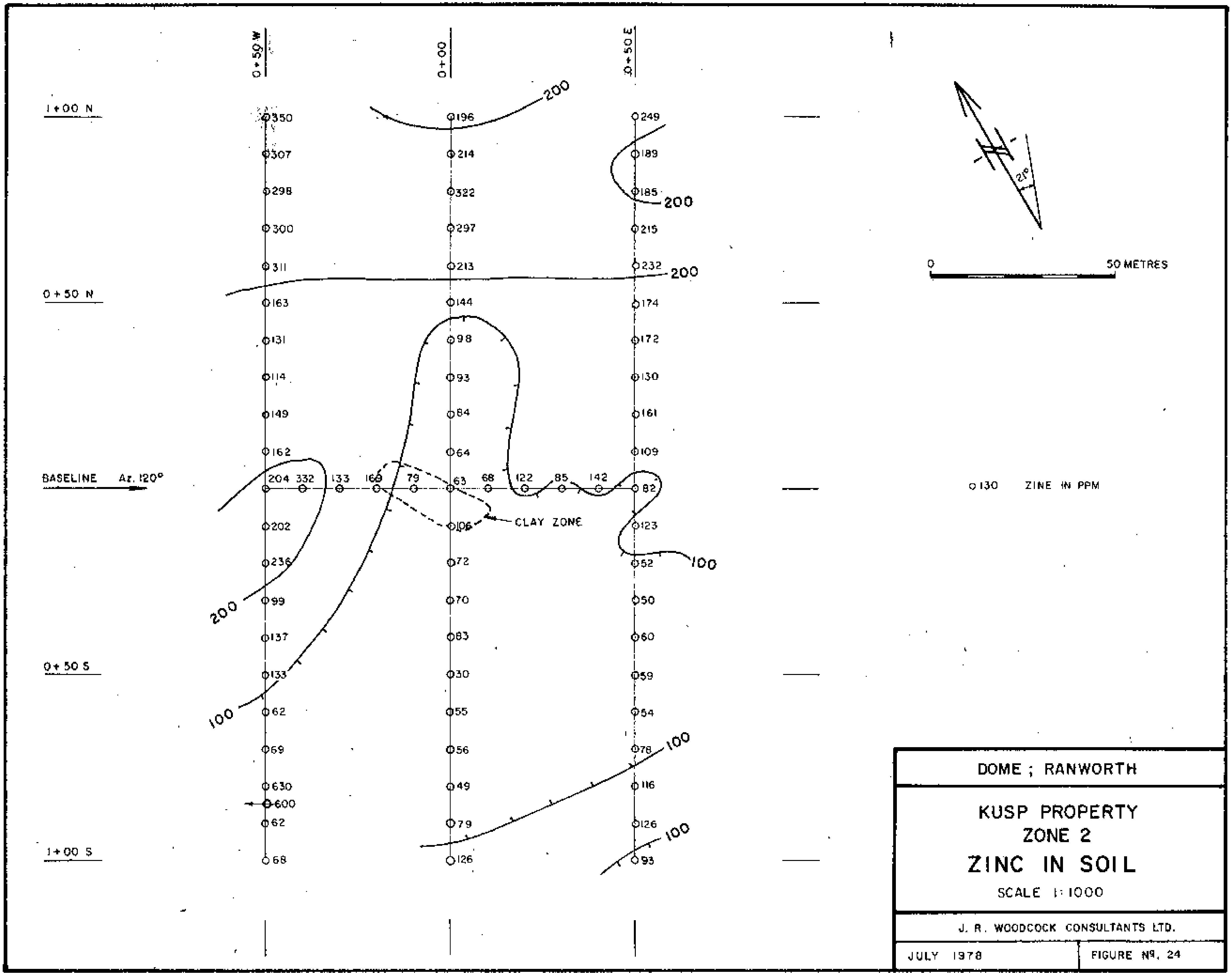
KUSP PROPERTY
ZONE 2
SAMPLE NUMBERS

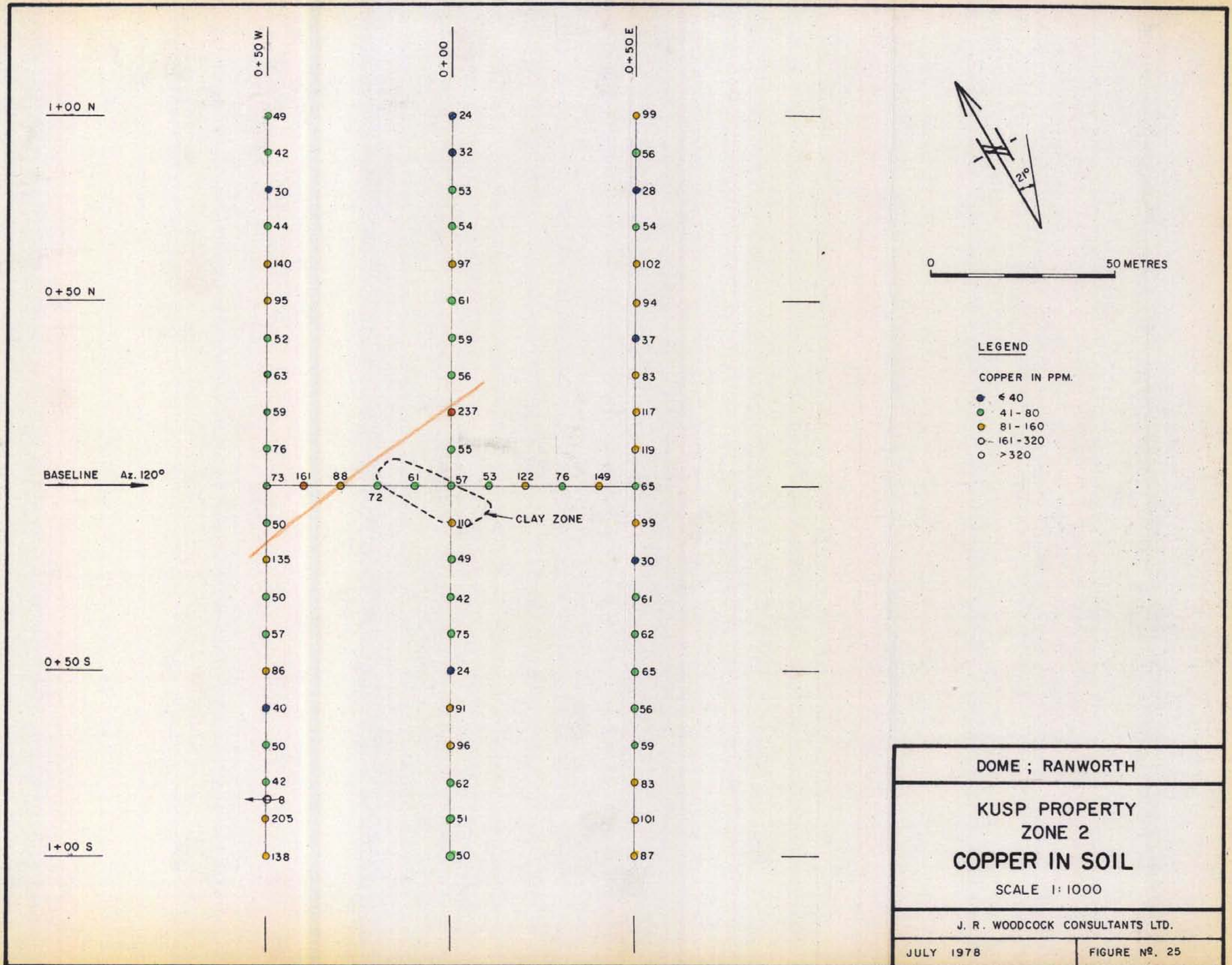
SCALE 1:1000

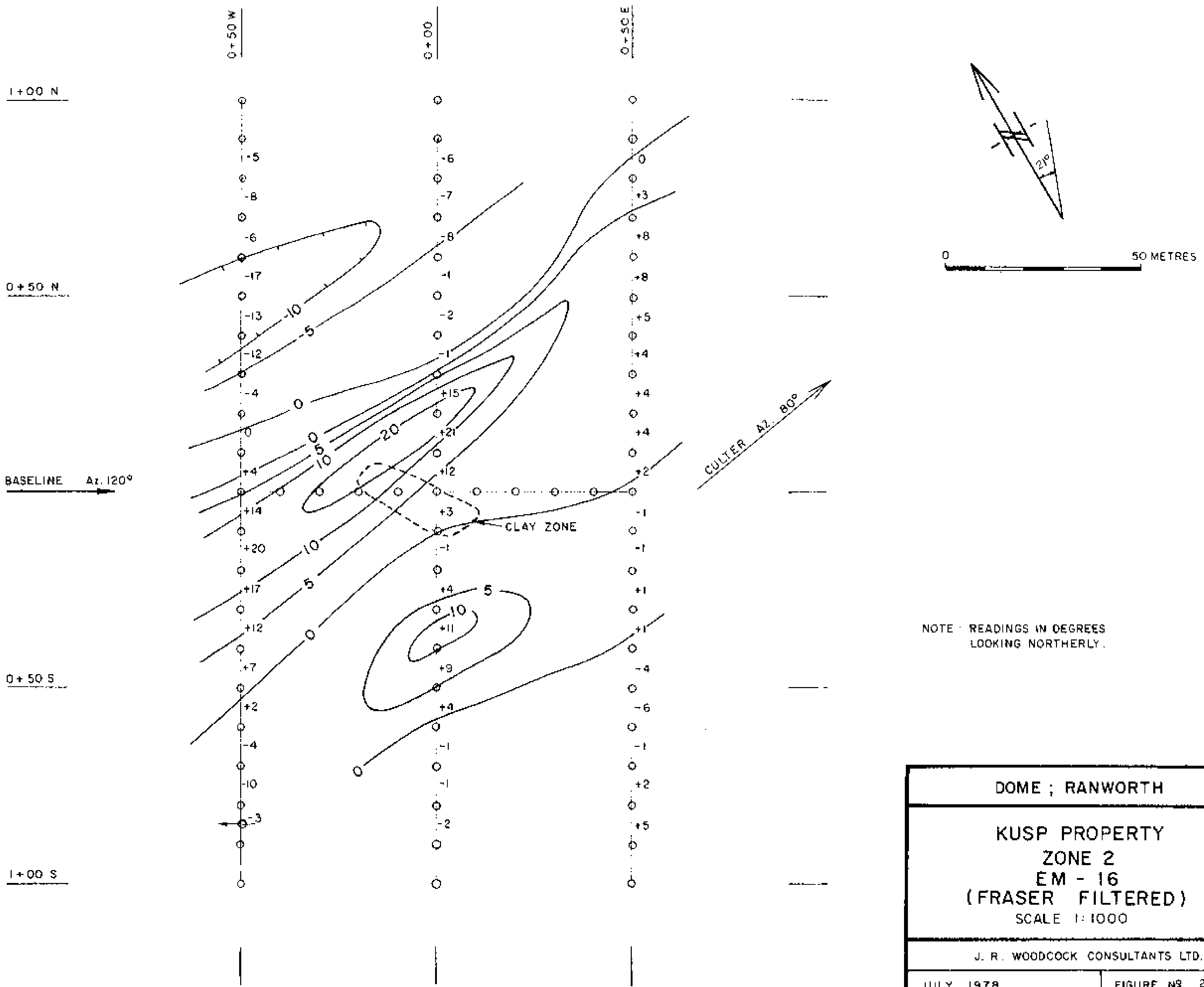
J. R. WOODCOCK CONSULTANTS LTD.

JULY 1978	FIGURE Nº. 22


0+50 W
0+00
0+50 E
1+00 N
0+50 N
BASELINE Az. 120°
0+50 S
1+00 S
35
31
29
31
55
32
193
153
69
100
69
70
66
55
254
126
246
140
92
90
91
155
164
60
36
34
34
33
13
26
35
47
16
15
23
21
39
113
175
124
102
169
610
272
85
60
29
30
37
34
25
19
25
35
36
20
28
64
92
253
93
141
73
26
29
27
22
21
20
20
15
14
30
60
120
CLAY ZONE
21°
0
50 METRES
LEGEND
O55 LEAD IN PPM
DOME ; RANWORTH
KUSP PROPERTY
ZONE 2
LEAD IN SOIL
SCALE 1:1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 23


0+50 W
0+00
0+50 E
1+00 N
0+50 N
BASELINE Az. 120°
0+50 S
1+00 S
350
307
298
300
311
163
131
114
149
162
204 332 133 169 79 63 68 122 85 142 82
202
236
99
137
133
62
69
630
600
62
68
196
214
322
297
213
144
98
93
84
64
106
72
70
83
30
55
56
49
79
126
249
189
185
215
232
174
172
130
161
109
123
52
50
60
59
54
78
116
126
93
200
100
CLAY ZONE
21°
0
50 METRES
o 130 ZINC IN PPM
DOME ; RANWORTH
KUSP PROPERTY
ZONE 2
ZINC IN SOIL
SCALE 1:1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 24


0+50 W
0+00
0+50 E
1+00 N
0+50 N
BASELINE Az. 120°
0+50 S
1+00 S
49
42
30
44
140
95
52
63
59
76
73
50
135
50
57
86
40
50
42
8
205
138
24
32
53
54
97
61
59
56
237
55
57
110
49
42
75
24
91
96
62
51
50
99
56
28
54
102
94
37
83
117
119
65
99
30
61
62
65
56
59
83
101
87
161
88
72
61
53
122
76
149
CLAY ZONE
21°
0
50 METRES
LEGEND
COPPER IN PPM.
≤ 40
41 - 80
81 - 160
161 - 320
>320
DOME ; RANWORTH
KUSP PROPERTY
ZONE 2
COPPER IN SOIL
SCALE 1: 1000
J. R. WOODCOCK CONSULTANTS LTD.
JULY 1978
FIGURE Nº. 25

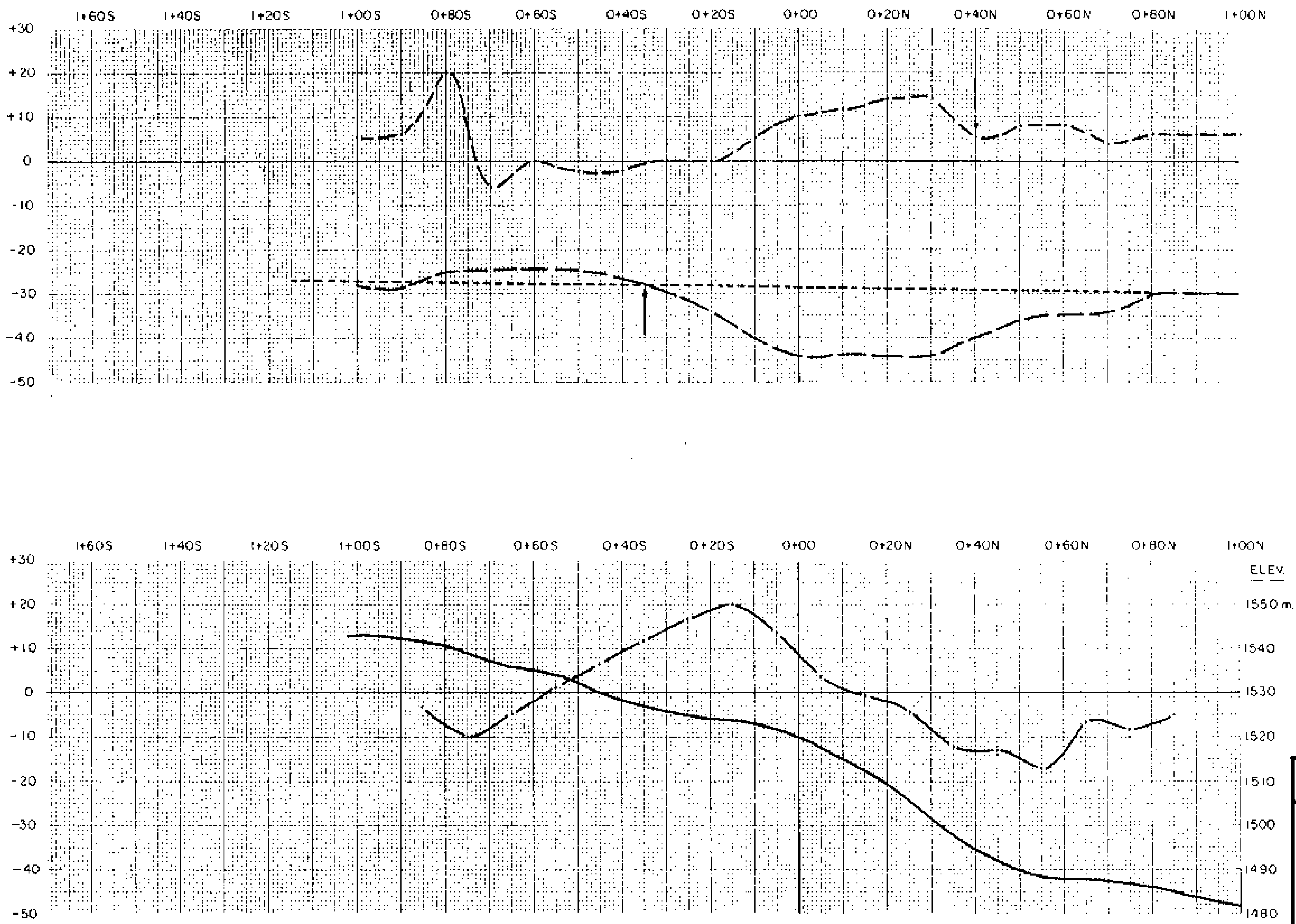


DOME ; RANWORTH

KUSP PROPERTY
ZONE 2
EM - 16
(FRASER FILTERED)
SCALE 1:1000

J. R. WOODCOCK CONSULTANTS LTD.

JULY 1978 | FIGURE Nº. 26



LEGEND

- Topography profile
- Tilt angle
- Estimated datum for tilt angle
- Quadrature
- Fraser filtered
- Quadrature change
- Tilt angle cross over

DOME ; RANWORTH

KUSP PROPERTY

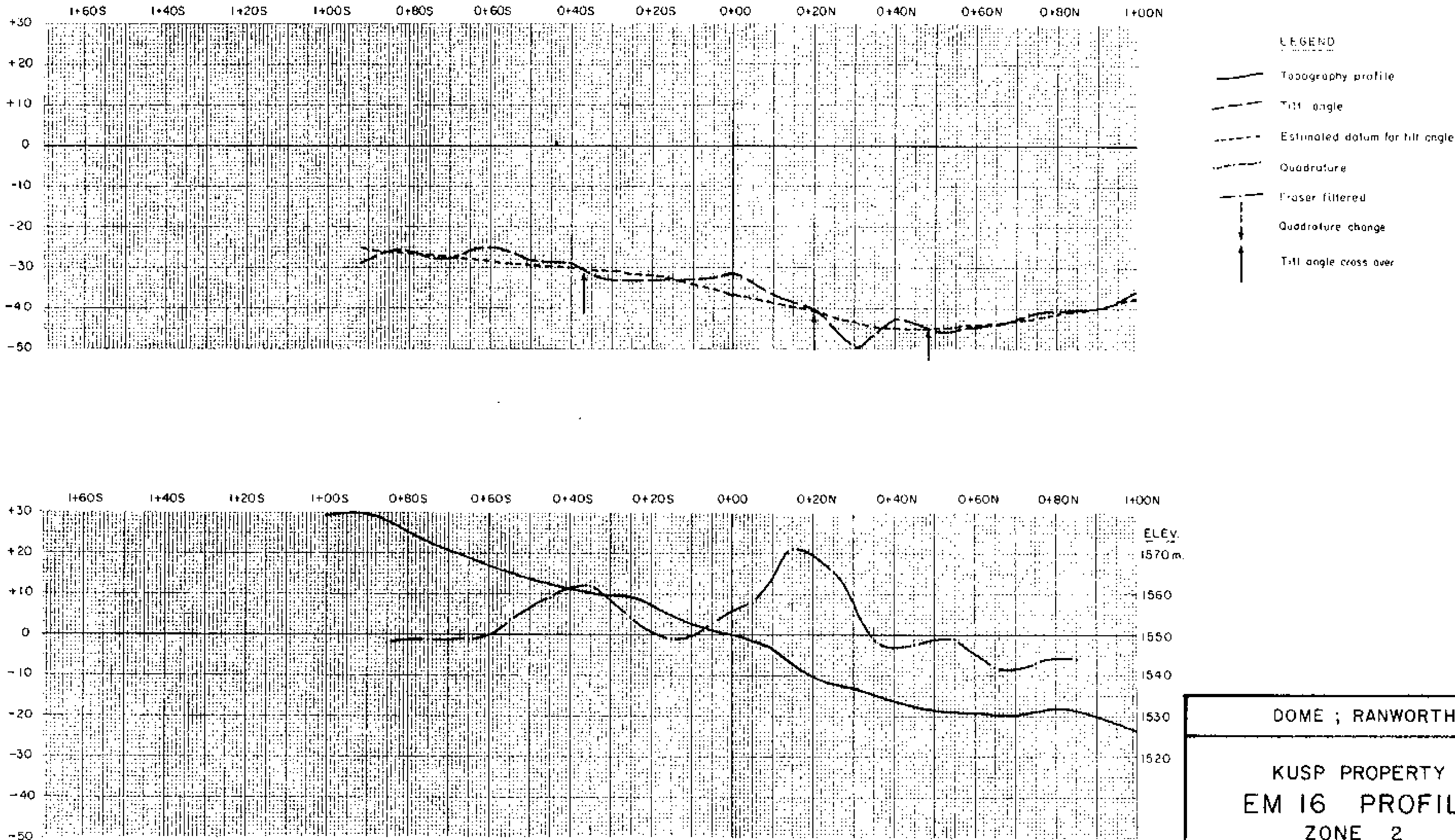
EM 16 PROFILE

ZONE 2

LINE 0+50W

J. R. WOODCOCK CONSULTANTS LTD

JULY 1978 | FIGURE Nº. 27



DOME ; RANWORTH

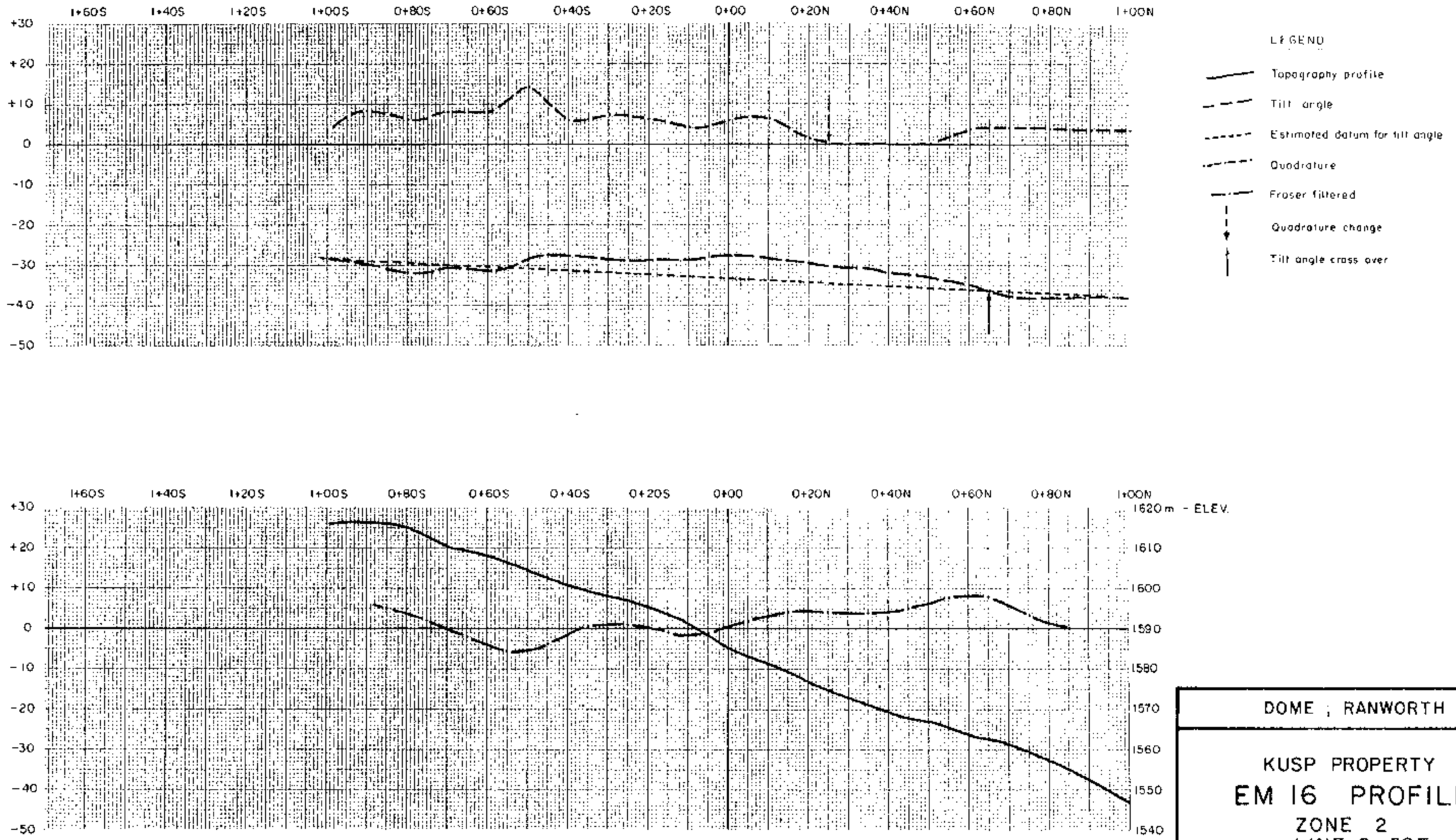
KUSP PROPERTY

EM 16 PROFILE

ZONE 2
LINE 0+00

J. R. WOODCOCK CONSULTANTS LTD.

JULY 1978	FIGURE Nº. 28



DOME ; RANWORTH

KUSP PROPERTY

EM 16 PROFILE

ZONE 2
LINE 0+50E

J. R. WOODCOCK CONSULTANTS LTD.

JULY 1978	FIGURE Nº 29

REFERENCES

Hyndman, D. W., 1968, Petrology and structure of the Nakusp map-area, British Columbia; G.S.C., Bulletin 161.

Reid, T. B., 1975, Geology Lardeau west half (82K-W$\frac{1}{2}$); G.S.C., Open File Report #288.

QUALIFICATIONS OF WRITER

1. B.A.Sc. 1951, M.Sc. 1953, Professional Engineer registered in British Columbia.

2. 1951 to 1978 working at geology and exploration mainly in British Columbia and emphasizing geological mapping, geochemical techniques, and geophysical surveys.

J. R. Woodcock

APPENDIX I

GEOCHEMICAL TECHNIQUES

In the field sampling, silt samples have been collected from the active parts of the streams. Soil samples have been collected from the B horizon, approximately six inches below the surface. In most cases the soil is a well developed podsol and a fairly rusty B horizon can be obtained. Occasionally a sample is collected from talus fines.

The samples were sifted with a -80 mesh screen at Vangeochem Laboratories Ltd. and the -80 mesh portion was analyzed by Mr. Eddie Tang, chemist. For digestion a 15% nitric acid plus 85% perchloric acid mixture is used. The metals are detected on a Tectron 4 Atomic Absorption unit.

APPENDIX II

COSTS

Wages - see following itemized list		$10,341.25
Camp costs, food, accommodation $24.45/man day for 72 man days		1,760.00
Transportation (20% of total)		230.00
Helicopter (50% of cost)		1,957.00
Geochemical		745.00
275 samples		
silt, soil preparation	$ .35	
rock preparation	1.25	
Cu, Pb, Zn analyses	2.25	
Ag analyses	.50	
Rent on geophysical equipment (EM-16, magnetometer)		300.00
		$15,333.25

WORK ON KUSP 2 CLAIM

Terry Booth

1977:	Sept. 22	total - 1 day

Paul Stanneck

1978:	June 4-7, 9, 12	$4\frac{1}{2}$ days
	June 18-July 1	14 days
	July 16-23	$7\frac{1}{2}$ days
		26 days + statutory holiday

Wm. Moody

1978:	June 18-July 1	14 days + statutory holiday

Les Westervelt

1978:	July 16-23	$7\frac{1}{2}$ days

Mary Watts

1977:	Aug. 17	4 hrs.
	Aug. 23	3 hrs.
	Nov. 8, 9	$5\frac{1}{2}$ hrs.
		$12\frac{1}{2}$ hrs.

J. R. Woodcock

1977:	Sept. 22	1 day
	Nov. 4, 8	3/4day
1978:	April 12	$\frac{1}{4}$ day
	June 1-2	3/4day
	June 16-July 2	18 days
	June 10	$\frac{1}{2}$ day
	July 16-18	2 3/4days
	July 19-31	$2\frac{1}{4}$ days
		$26\frac{1}{4}$ days

Summary of Wage Costs

Terry Booth	1 day @ $100	$ 100.00
Paul Stanneck	27 days@ $ 75	2,025.00
Wm. Moody	15 days@ $ 50	750.00
Les Westervelt	$7\frac{1}{2}$ days@ $ 37	277.50
J. R. Woodcock	2 days@ $210	420.00
	$24\frac{1}{4}$ days@ $275	6,668.75
Mary Watts	$12\frac{1}{2}$ hrs.@ $ 8	100.00
		$10,341.25