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NICHOLLS RANGE

56-126

Nicholls ~~Area~~ Range

A.E.E. 18/12/56.

(+ FIGURES ATTACHED)

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# LYELL - E.Z. - EXPLORATIONS

Q72

3 - one for each file.

1st March, 1957

Mr. G. Hall,  
Superintendent,  
Electrolytic Zinc Co. of A'asia Ltd.,  
ROSEBERY.

V.M.C.  
I.C.M.

**MICROFILMED**

G.5.

Dear Graham,

Your letter of 22nd and 25th February concerning reports from the field geologists have been referred to Dr. Scott who comments as follows:

1. Findon's Area

- (a) M. L. Wade withdraws his remarks regarding the surface leaching of the outcrops.
- (b) M. L. Wade will search the old assay reports in an attempt to locate the results of the samplings performed at Lake Jukes.

2. Nicholls Range

In a discussion with M. L. Wade the following points were established:

- (a) The pitch of the drag fold in the picture is horizontal.
- (b) The general pitch of the folds in the area is horizontal or gently to the north or south (top of page 3 of the report).
- (c) The drag fold in the picture indicated that the limb is overturned with an anticline to the east and a syncline to the west, the fold axis dipping to the east.  
(This structure is identical to that established by Sampey in the Hamilton Range area).
- (d) At the time that Wade made his investigation it was thought that the beds in the Nicholls Range were on the west limb of a major syncline. This was based on a faulty photo-interpretation and later work has shown that the major fold is non-existent.

Reverses statement in his report.

(1)

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(e) From all available evidence my interpretation of the area has been that it consists of an isoclinally folded series of schists and metaquartzites, which are overturned to the west (i.e. fold axes dipping to the east). The pitch is variable, gently to the north south or horizontal.

3. Hamilton Range

The schists at the Hamilton Range differ mineralogically from those at the Nicholls Range. Those at the former locality contain garnet which is apparently absent from the latter locality. On this basis it may well be that the schists at Hamilton belong to the Franklin Group, whilst those at Nicholls the Scotchfire Group."

*same group - diff. - we know this*

For your interest, Dr. Scott, in conversation with me, has expressed his pleasure that you are able to find time to critically examine the field reports. Your comments are appreciated.

Yours sincerely,

*G. F. Thompson*

Manager.

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LYELL - E.Z. - EXPLORATIONS

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①-72

18th December, 1956

NICHOLLS RANGE.Locality and Access

The Nicholls Range copper occurrence is situated near the headwaters of a small creek which drains eastwards from the Nicholls Range into the Maxwell River, about  $3\frac{1}{2}$  miles upstream from the confluence of the Maxwell and Gordon Rivers. It is less than one mile north of and 850 feet below a prominent white quartzite knob east of the Gordon River gorge.

In previous reports, Jakins and Blake have described the isolated nature of the deposit and the difficulty of access. To this may be added that flying time from Queenstown to Nicholls Range, by Bristol Sycamore helicopter is 40 minutes, a distance of about 45 air miles.

Topography and Vegetation

A proper recognition of the topography and surface cover is important in understanding the assessment of the Nicholls Range prospect.

Briefly the main topographic elements are:

- (1) The Nicholls Range - a north-south trending narrow range extending about 8 miles north of the junction of the Gordon and Maxwell rivers.
- (2) The deeply dissected eastern flank of the range.
- (3) The wide valley of the Maxwell River with Hamilton Range east of this again.

The photo map show that these units are related to broad folding in the Pre-Cambrian rocks with the Nicholls and Hamilton ranges consisting of resistant quartzites on the limbs of the fold and less resistant rocks in the Maxwell valley on the fold axis.

More locally, the narrow central ridge of Nicholls Range, which is about 1000 feet above the Gordon and Maxwell rivers, consists of resistant hard grey and white quartzite and quartz schists. The strike is roughly meridional and the dip about 60-70° to the east, but intense contortion, and in places overfolding occur. Softer, more micaceous quartz schists occur on the eastern flank of Nicholls Range and these rock types have been deeply dissected by a network of small gullies which flow east into the Maxwell. On this eastern flank exposures are very scarce. The creek beds are masked by boulders and moss covered slabs of detritus and dead trees, and the gullies are covered in a dense mantle of horizontal scrub, myrtle, fern, laurel, sassafrass, gum, ti-tree and cutting grass, and on the spurs there is an equally dense growth of vegetation including bauera. Soil cover also is deep. The result is that exposures occur in occasional creek cliffs and rarely in creek beds; also it is extremely difficult to move around to prospect.

The Nicholls Range copper occurrence was found (by pine getters?) beneath a copper stained cliff face in one of the rare rock exposures in the area.

### Geology

The Nicholls Range consists of highly contorted Pre-Cambrian quartzites quartz schists and quartz mica schists. The more resistant beds form the topographic highs and the more micaceous or schistose rocks form the dissected eastern flank. From photo interpretation the range is an east dipping western limb of a broad syncline the north plunging nose of which lies immediately north of the Gordon River upstream from the Maxwell.

At the copper deposit there is a highly contorted and drag folded series of quartz schists and quartz mica schists which show evidence of reversals of pitch. The mineralisation is undoubtedly related to shearing and intense minor drag folding of a more favourable bed, and the copper is exposed because of protection from erosion by a high, overhanging, more resistant bed.

#### Mineralisation

A compass and tape map was made of the narrow gully containing the copper deposit. This plan, which accompanies this report, shows two ore horizons each about 12 feet in width, and one about 40 feet in length, separated by 20 feet of barren rock. The ore beds strike about  $320^{\circ}$  E of N and dip north east at about  $65^{\circ}$ . The mineralisation is quite strong, consisting of primary copper sulphide (chalcopyrite) containing about 1.5% Cu. and weathered at surface to oxy salts. Gangue is quartz and micaceous material (sericite?).

The chalcopyrite is bright yellow and coated with covellite and generally free of pyrite. Other copper minerals at surface are chalcantite, malachite, azurite and a little native copper and black oxide. For sampling it was not possible to clean up the faces completely free of oxidised products, especially in Lode No. 2.

It is doubtful if previous observers have noted the presence of two separate lodes.

#### Conclusions

The lode widths are small for such an isolated prospect and only a short length is exposed. However, the topography and heavy surface cover of soil and vegetation are such that it is quite impossible to say what else may occur in the locality. In favour of further investigation is the occurrence of two primary sulphide lode outcrops where exposures are extremely limited and the fact that the copper occurs in a favourable host rock associated with intense minor drag folding and shearing.

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Recommendations

The area in question, about 5 miles north and south and 5 miles east and west requires airborne electro-magnetic investigation. The A.N.A. pilot, Jim Ferguson, assures me that this area would be quite suitable for this work.

In the event of anomalies being located the area requires some burning off and costeaning or shallow pilot drilling.

It would be possible to quickly clear a landing site above the copper stained cliff and drill a short hole, about 200 feet in length into the known copper occurrence.

M. L. Wade

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ASSAY REPORT

17th December, 1956.

<u>Date of Sample</u>	<u>Description</u>	<u>Cu.%</u>	
14-12-56	Nicholls Range - Sample No. 1	1.63	} <i>lot 1</i>
	2	0.81	
	3	1.03	
	4	0.35	
	5	1.66	} <i>lot 2</i>
	6	0.67	
	7	1.31	

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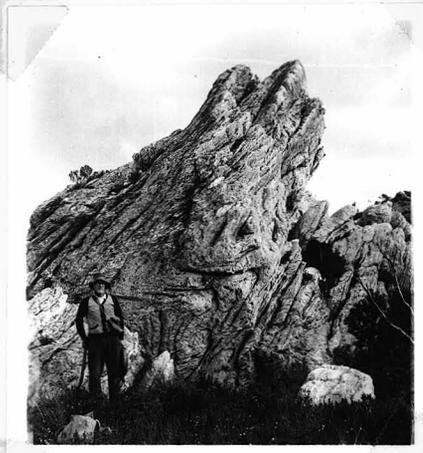
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NICHOLS RANGE  
Cu DEPOSIT.



LOOKING SOUTH.

SHOWING CONTORTED  
PRECAMBRIAN QUARTZITE.

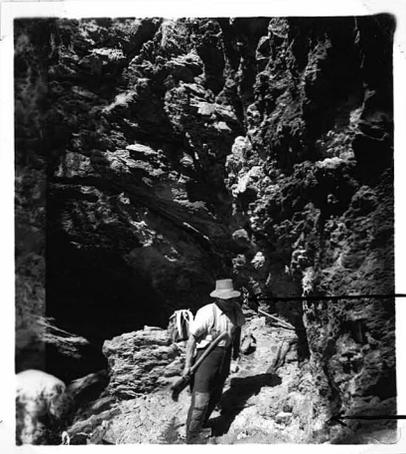


LOOKING SOUTH.



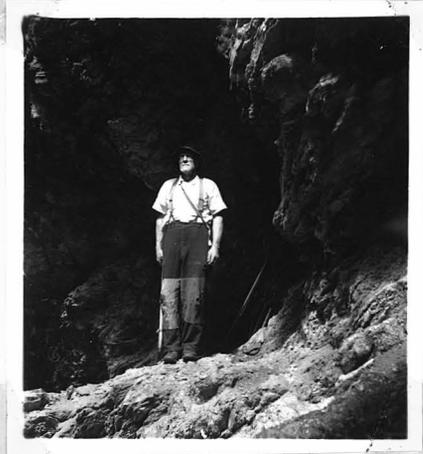
Looking North.

SHOWING LODE 1 AT SITE EXPOSED  
BY MAJOR LOVE.



LOOKING EAST.

WIDTH  
SAMPLED.



LOOKING EAST.



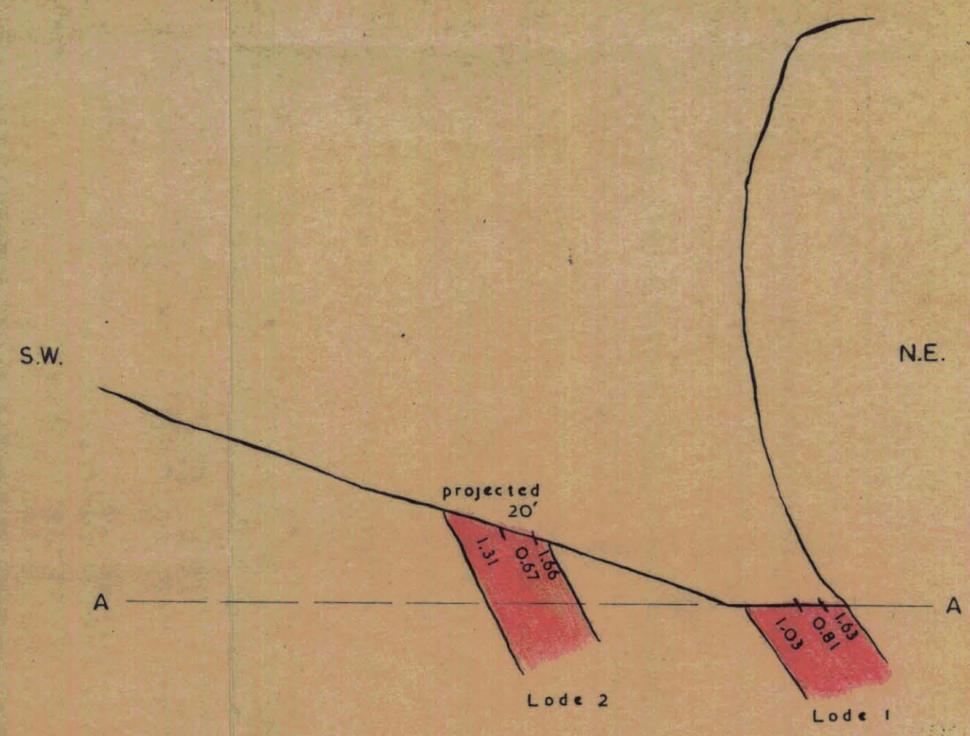
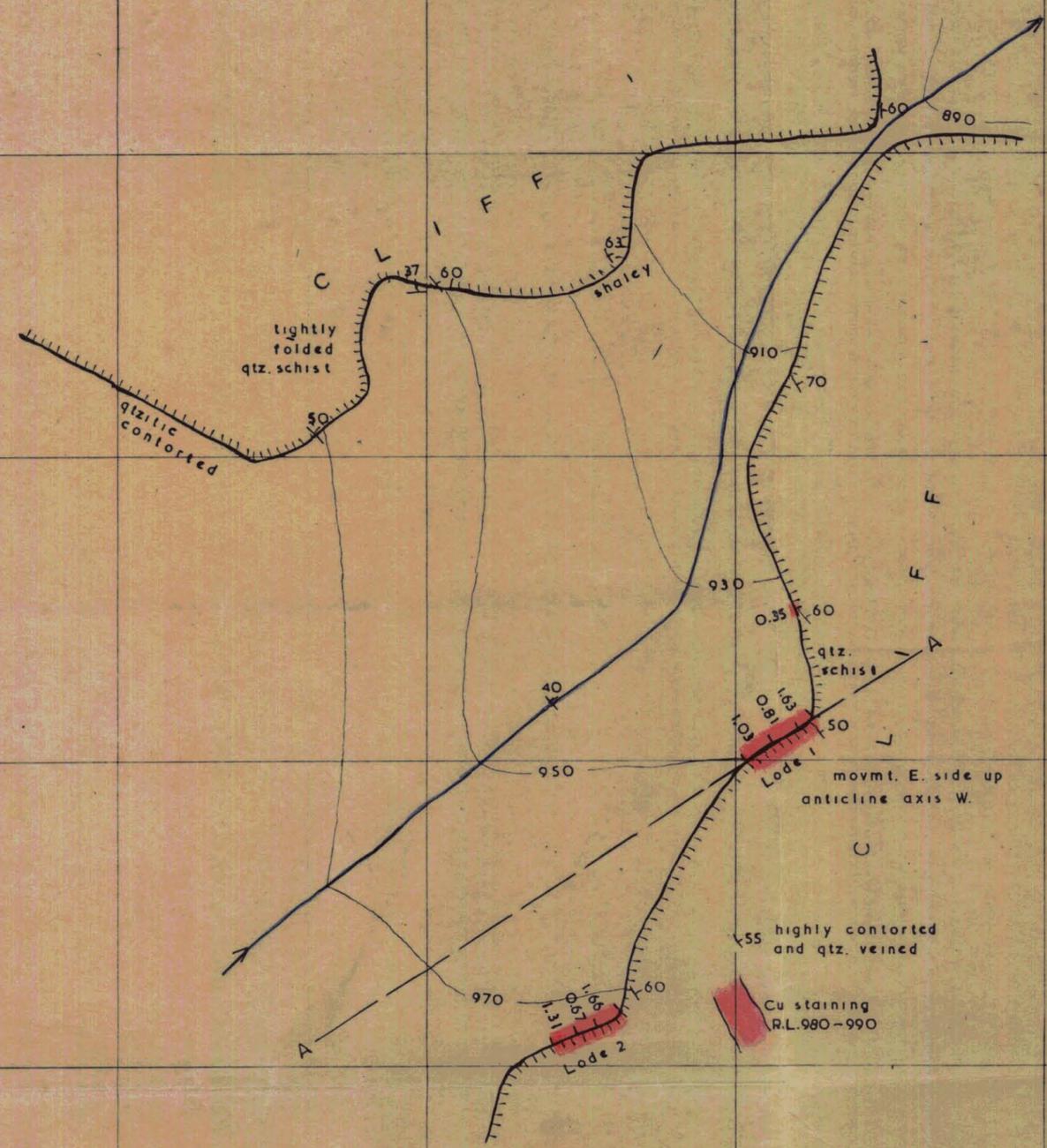
5 cm

**NICHOLS RANGE**

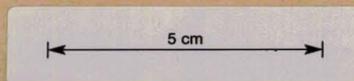
LOCALITY SKETCH

Scale: 0 1 2 Miles

Q1



Section looking N.W.

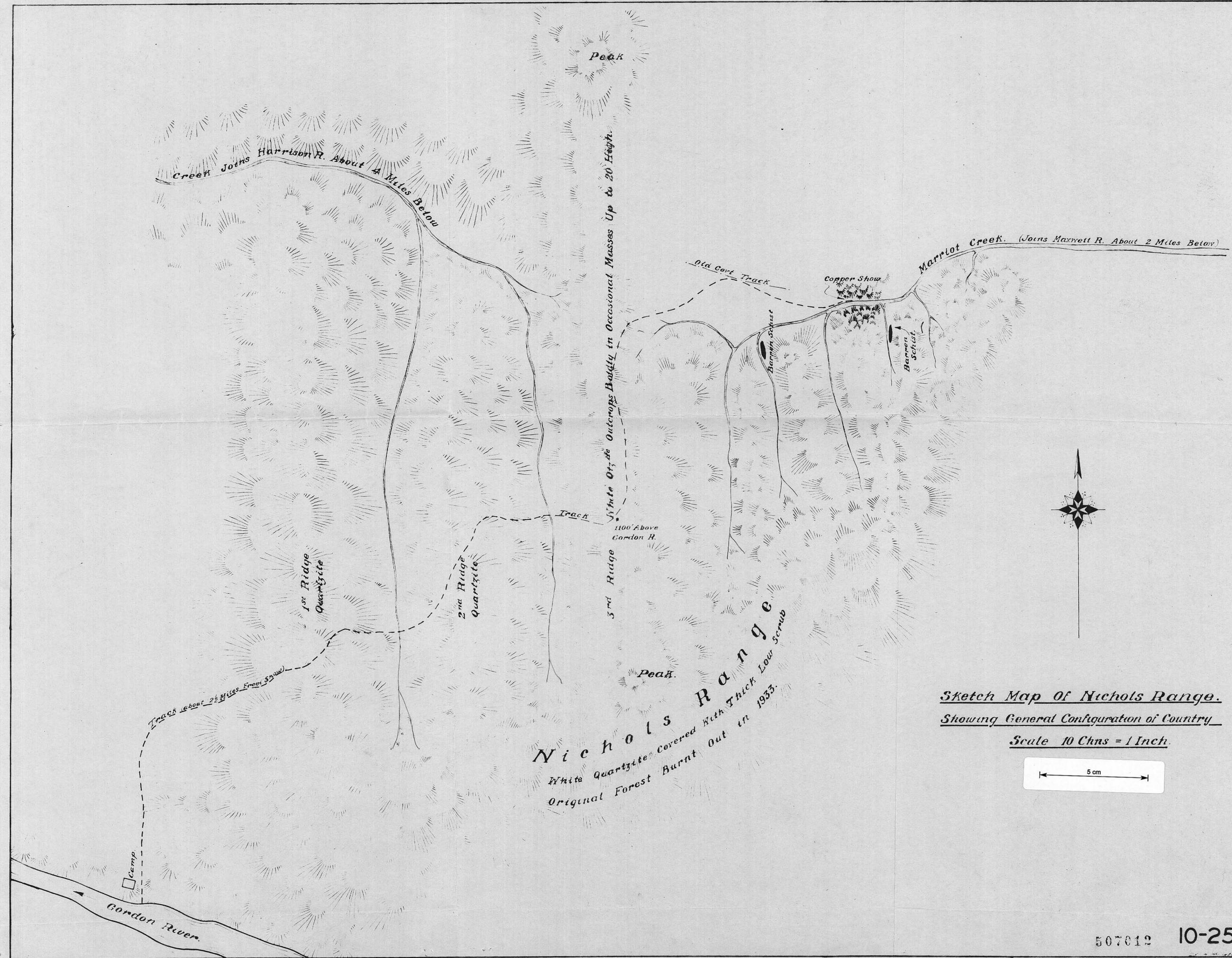


**NICHOLS RANGE**

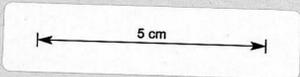
Surface Plan and Section A-A

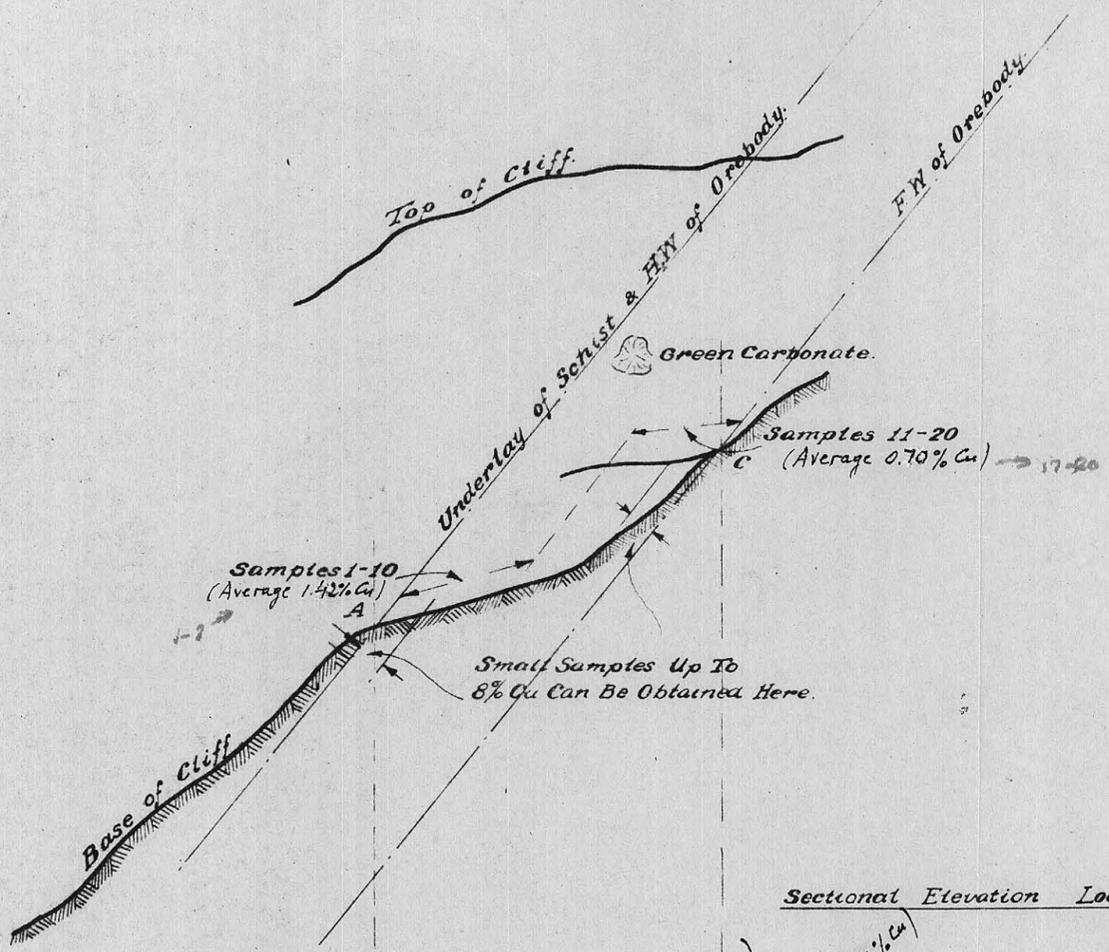
SCALE 1" = 20'

December 1956

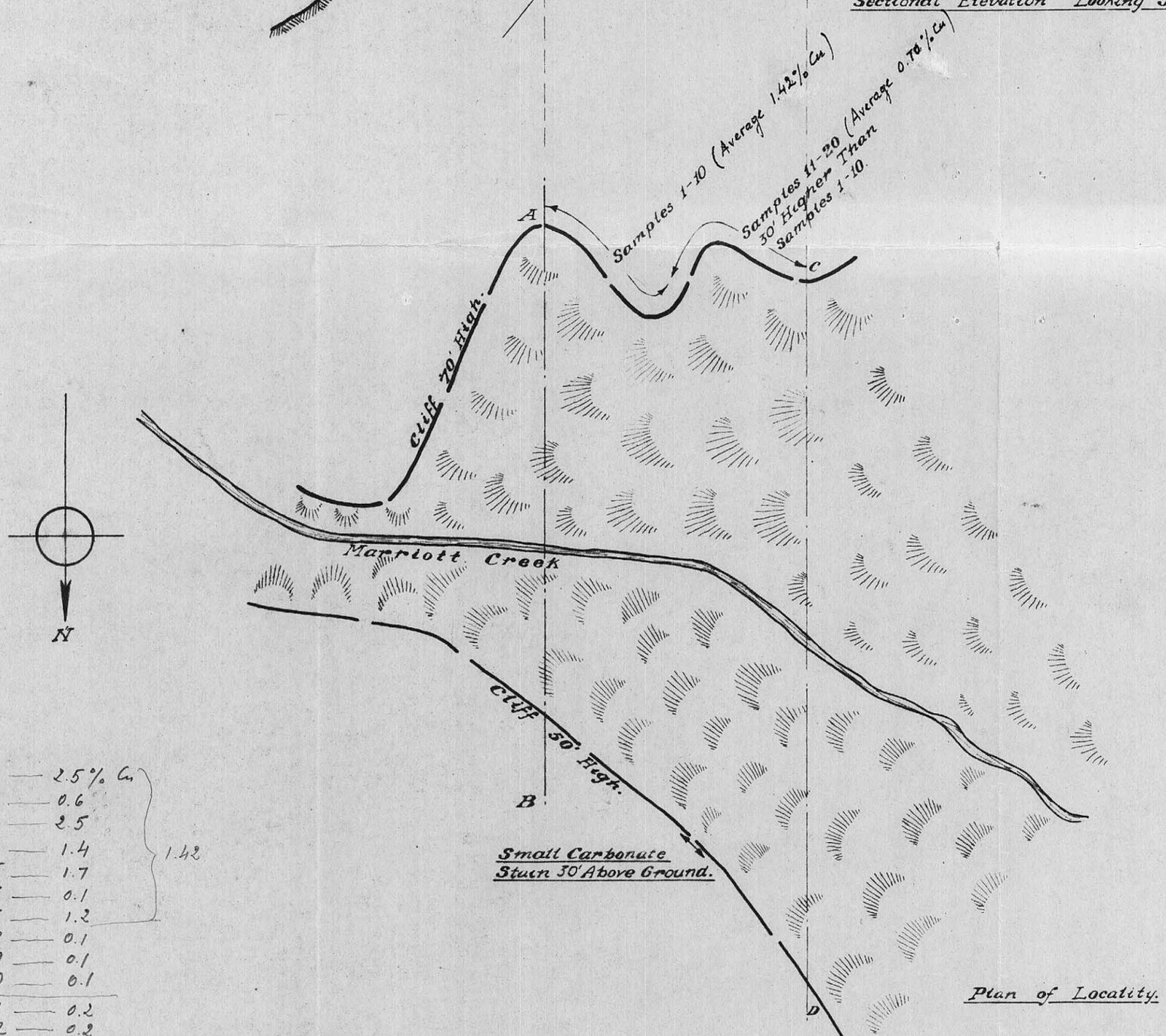


Sketch Map of Nichols Range.  
Showing General Configuration of Country  
Scale 10 Chns = 1 Inch.





Sectional Elevation Looking South 30° East.

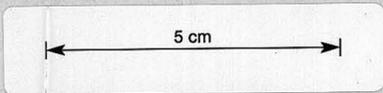


Plan of Locality.

Sample No 1	2.5% Cu	} 1.42
2	0.6	
3	2.5	
4	1.4	
5	1.7	
6	0.1	
7	1.2	
8	0.1	
9	0.1	
10	0.1	
11	0.2	} 0.70%
12	0.2	
13	0.1	
14	0.1	
15	0.1	
16	0.1	
17	0.7	
18	1.2	
19	0.4	
20	0.5	

Nichols Range Copper Show

Scale 1" = 30 Feet.



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