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SUPPLEMENTAL NOTES

ON THE

GEOPHYSICAL RESULTS ON CEDAR CLAIMS

LIKELY, B.C.

FOR

UNION CARBIDE CANADA MINING LIMITED

BY

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EXPLORATION GEOPHYSICAL CONSULTANT

- September 12, 1974 -

INTRODUCTION

The following discussion is based on geophysical data presented in a report by D.M.T. Bowen (June 1974), and indeed the comments here made and the conclusions drawn should be viewed as a logical adjunct to that report. Reference is made to the drawings included with it, although one figure (Fig. V) has been redrawn to better illustrate the effects involved. A simple plan at 1"=500' has also been compiled to show the main interpretational elements perceived. These two new plans are herein identified as Drawing Nos. EIC - 88 and EIC - 89 respectively.

DISCUSSION OF RESULTS

With the amount of I.P. anomaly (Fig. II) that has been obtained from the seven traversings undertaken over the Cedar claims target setting, it becomes of first order importance to tie down the drill line No. 1 of the earlier (1931) Dolmage investigation. In fact, this is one of the stated objectives of the present survey. However the tie itself is a difficult thing to accomplish precisely, particularly when three maps emanating from the latest work show three different positions for Grogan Creek (Figures II, IX, X). The grid it seems should be shifted relative to topography some 300' east and 500' south from where it is shown (Figure IX). This would place the so-called Dolmage sulphide zone, on the weight of evidence, between lines 52NW and 56NW and possibly closer to the latter. Happily this last is the section where the I.P./resistivity information is most complete.

On this basis, a reconciliation between the Dolmage drill results and present geophysics is made as a fair reflection of realities. The Dolmage section shows three features of note in the bedrock surface, two major buried channels and a 700' wide section of shattered bedrock occurring on the section from between 300' and 1000' NE of its BL. This shattered material is notably mineralized and represents the central interest for the current work. It correlates with a

definite I.P. expression reaching to some six-times above background in association with a pronounced resistivity low between 1+50NE and 2+50NE on the line 56NW section (Fig. III). This is an anomaly that doesn't shift position nor change very much in essential character according to electrode array employed (pole-dipole versus dipole-dipole). Such outcome suggests a flat dip to the source. On the other hand, the pseudosection, particularly in normalized I.P. (Dwg. No. EIC - 88), shows a pattern typical to a body with considerable vertical or down-dip continuity. Nevertheless there is an apparent break between the two components of this picture which would seem to allow both to exist, that is, a flat slab near-surface lying in effect on a steeply dipping zone below. Why appearances may be a little deceiving here is that the dipole spacings employed, viz. 100' and 200' are in the same order as or smaller than the likely source widths involved, thereby virtually guaranteeing slab-sided response curves. For all that it is to be noted that the actual combination of near-surface slab overlying a steep zone in depth would in fact be quite compatible with the sulphide zone in shattered bedrock noted in the Dolmage drilling if it overlay a mineralized fault/shear zone extending vertically in depth below it. However, there is an exception in the indicated width involved, 100' - 150' versus the 700' of the drill section. This suggests that only the thickest portion of the Dolmage sulphide zone has prevailed upon the I.P. measurements; alternatively it means, since the greatest thickness of shattered bedrock intersected is only 10', that this near-surface sulphide-rich material is everywhere providing a rather negligible contribution in I.P. and that the real cause of the anomaly comes overwhelmingly from what lies below. The reality undoubtedly falls somewhere in between but favouring the latter.

Further impetus for this conclusion is given by the chargeability peak at 12NE on the line 56NW section. This is not only the strongest individual response observed but appears at the heart of the recorded anomaly for the setting. Also because of the spatial relationships already inferred, this pre-eminent response belongs not to the Dolmage sulphide zone on Grogan Creek, but to the northerly bedrock trough located at approximately 1700' NE of the BL on that early drill

section. Unbottomed by the shallow drilling then, nevertheless an in-filling wedge of over 60' of intermixed clays and gravels was shown to exist here, all drill holes in which material incidentally returning pay values in gold. Notwithstanding this considerable increase in cover, the I.P. anomaly strengthens in this locality while resistivities at the same time drop to extreme lows, less than 20 ohm-metres in the centre (Dwg. No. EIC - 88). Clearly if sulphides concentrated in a relatively thin layer at the bedrock surface only were present, these would not be the defining circumstances. I.P. anomaly alone could be expected to diminish drastically. That it doesn't, along with the wide (800') and persistent zone of resistivity low correlating, places the source of the polarization dominantly within bedrock.

This northerly I.P. anomaly actually develops into a very definite zone, extraordinarily well-developed by the normalized I.P. parameter, both on the line 56NW pseudosection and across the grid from line 40NW to 64NW (Fig. IV). Quite linear in strike and accompanied by its resistivity lows throughout, the anomaly system displays all the characteristics of a major fault zone, almost assuredly a main axis of the Cedar Creek structure deduced from photo-geology. On line 56NW it appears buried some 75' from surface but is steeply dipping and extensive in down-dip extent. According to the amount of chargeability inherent, it is widely if not heavily mineralized. It forms a natural exploration target in the present context. Interestingly enough, the question that its placement gives rise to is this: if this is the result over the northerly Dolmage bedrock trough, what can be expected from the second one lying to the south, 2800' to the south (1100' south of the BL) according to the Dolmage section. Here too there is a distinct increase of pay gold in the overlying cover. Unfortunately the I.P. coverage barely extends this far. While it is true that on several lines measurements have been taken to 11SW in the present work, this is not the same grid, nor the same BL. In fact if the current calculations made of relative grid positions are anywhere near correct, then the present I.P. traverses would need to have been taken to 15SW to centre on the trough and to 20SW to have encompassed it.

What is seen to the south as far as the coverage has gone is a sequence of chargeabilities rising again following the main central anomalies already discussed, but an increase here attended by rising resistivities. These latter are significant in that they are general enough to presume a lithologic change. A contact between contrasting resistivity levels can in fact be drawn across the grid (Dwg. No. EIC - 89). Persuasively, this locus largely finds a ready fit with a similar contact that can be drawn from the magnetic data (see also Dwg. No. EIC - 89) although it needs be noted here that the contrast is not between disparate levels so much as it is between degrees of relief, viz. the sectors north and east of the contact are perceptivly quieter magnetically than those to the west (Fig. I). To ascribe geologic identities to the two units so recognized is somewhat more problematic but the inclination is to place andesites to the south-west, sediments to the north-east, these being the two rock-types broadly classified in the region. In any case, the implied fault zone of 12NE on line 56NW is seen to be essentially non-conformable with the contact although generally pursuing a similar north-west trend.

The extremely low resistivities encountered along this fault line give some pause for reflection. It seems unlikely the circumstance is entirely due to sulphides, particularly when other possibilities crowd in. There is almost certainly some contribution from related electrolyte solutions existing in the sheared rock, and perhaps there is considerable fault gouge material similarly located making its presence felt. But in addition it is noted that on the Dolmage section clays in the overburden definitely tend to concentrate in the in-filling material of the main bedrock troughs. Such clays again almost certainly would be a factor if they are at all persistent in depth and on strike with these features.

The observed low resistivities here are thus liable to be multiply caused and to yield in consequence an exaggerated enhancement of the plotted metal factor parameter (e.g. Fig VI). But such conditions are not necessarily belittling to

the particular chargeabilities involved. These on probabilities continue to express sulphides uniquely and are not affected by the other non-metallic sources noted. However clays whether in the overburden or in fault gouge can at times be made to polarize according to composition, and their presence here therefore does introduce some measure of unpredictability. Nevertheless the chance that clays are significantly compounding the recorded I.P. anomaly in the present case is considered a remote one although it remains for drilling to finally resolve the point.

CONCLUSIONS AND RECOMMENDATIONS

Very clearly the I.P. survey has been effective in attaining its primary objective on the Cedar claims, to wit, finding and defining an anomaly more or less where it was sought as projected from the Dolmage - reported sulphides. But it is also fairly clear that these I.P. results promise much more, not one mineralized zone but a number, possibly three or more, all intimately related to a through-going fault structure and its satellite shatter zones. From the Dolmage drill evidence, the better pay material in overburden occurs in the vicinity of the larger bedrock troughs, and if anything to their down-slope side. It follows therefore that the mineralized bedrock itself below the troughs offers optimum chances in auriferous sulphides. It is here in their context that the I.P. data is so suggestive since some of the best chargeabilities in the area have been obtained in correlation with the deeper Dolmage troughs, and this to the extent of the coverage only. (One Dolmage trough has not been investigated by the present surveying.) Corresponding resistivities drop right off in this association, but it is concluded the cause is not wholly due to sulphides. Thickening clays in the overburden encountered over the troughs are presumed a contributory factor. Nevertheless the sulphide contribution is still considered substantial, and the further exploration of the emergent zones in consequence becomes a logical follow-up step.

It is recommended therefore that diamond drilling of the bedrock be undertaken for the following three target features, the peak anomaly over the inferred fault zone, the shoulder of polarization that accompanies it on the line 56NW section, and the chargeability expression that reflects the original Dolmage sulphide zone at Grogan Creek. Suitable initial holes for this purpose would be:

DDH # CC-1 — Collar at 10+50NE/56+00NW
to be drilled (grid) NE at -45° for 450'.

DDH # CC-2 — Collar at 13+25NE/56+00NW
to be drilled (grid) NE at -50° for 400'

DDH # CC-3 — Collar at 00+50NE/56+00NW
to be drilled (grid) NE at -45° for 400'

On-strike considerations would probably see the early testing of lines 60NW and 52NW whereon similar I.P. and resistivity effects have been sustained as on 56NW. Such further drilling would be to confirm indicated structural relationships and to establish mineral trends, if any. In anticipation, three additional holes are sited as follows:

DDH # CC-4 — Collar at 11+00NE/60+00NW
to be drilled (grid) NE at -45° for 450'

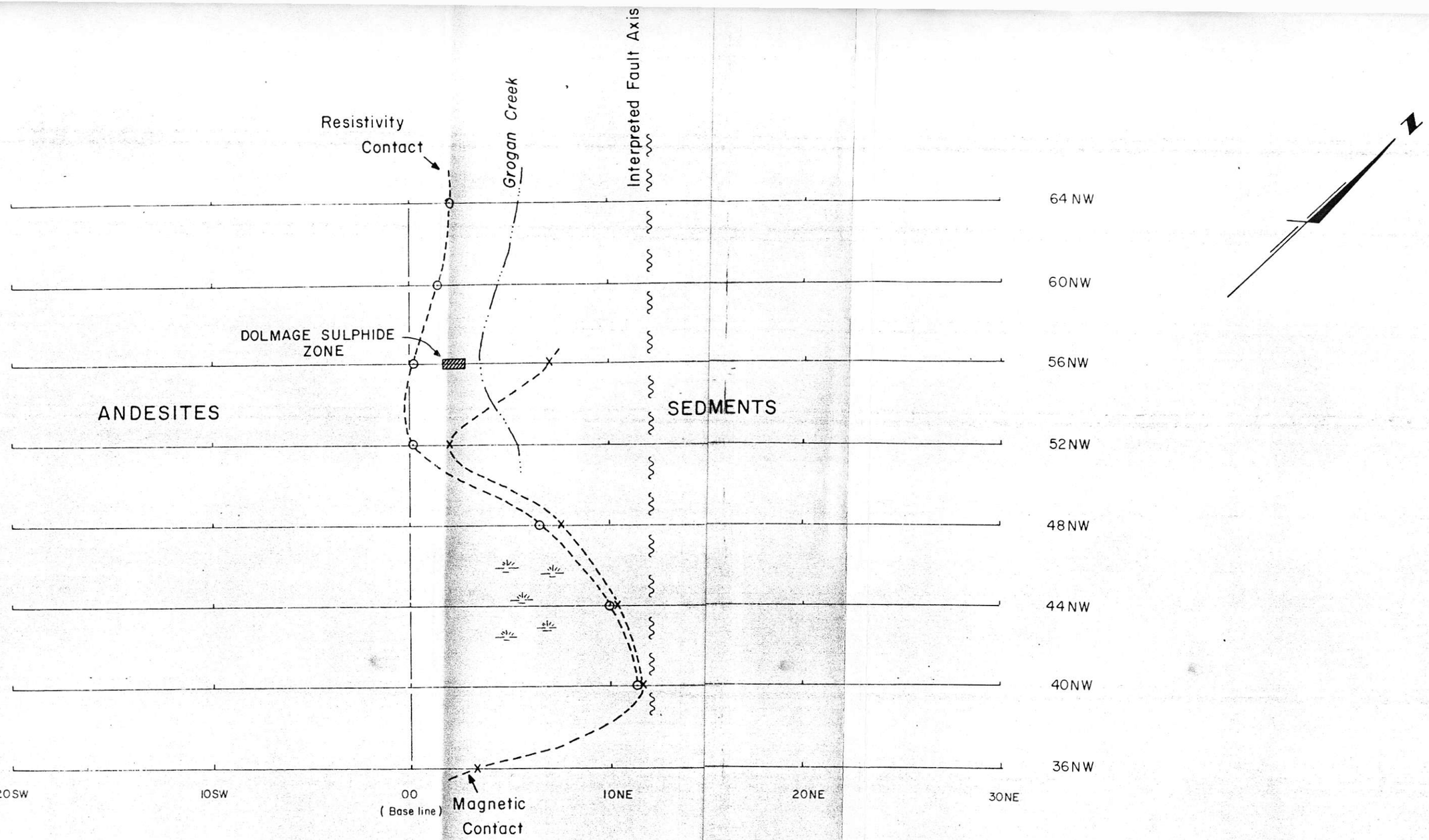
DDH # CC-5 — Collar at -0+00NE/60+00NW
to be drilled (grid) NE at -45° for 450'

DDH # CC-6 — Collar at 10+00NE/52+00NW
to be drilled (grid) NE at -45° for 550'

A total of 2700' of drilling is so laid out which should furnish an adequate exploration sampling of bedrock sulphide mineralization in this setting for its contained gold content and to provide a measure of inherent potential.

JBB:sm
September 12, 1974

J. B. Boniwell
Exploration Geophysical Consultant



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CEDAR CLAIMS, LIKELY, B.C.

INTERPRETATIONAL PLAN

Scale 1" = 500'

DWG No. E.I.C. - 89

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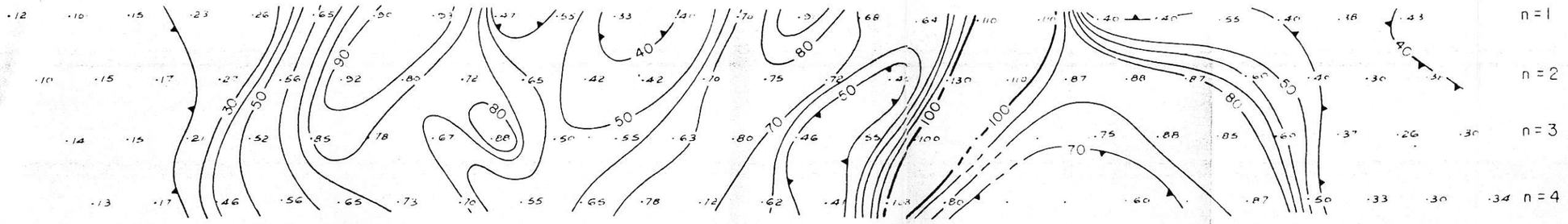
Dolmage sulphide zone Grogan Creek

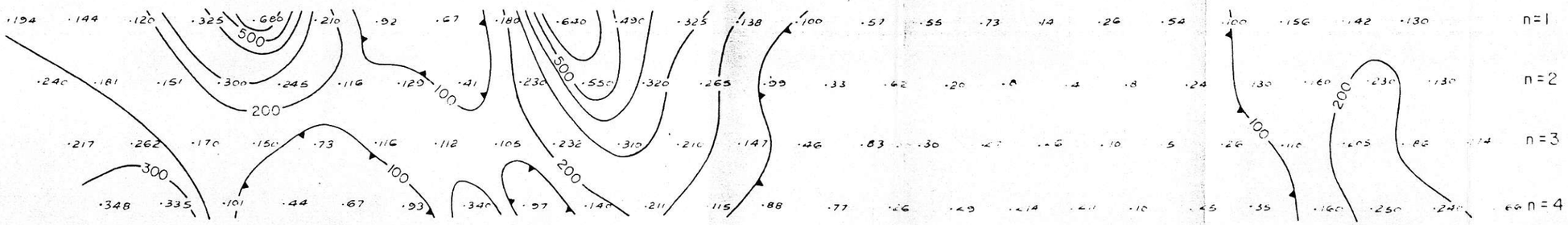
4SW 00 4NE 8NE 12NE 16NE 20NE



Ma

(millisecs)

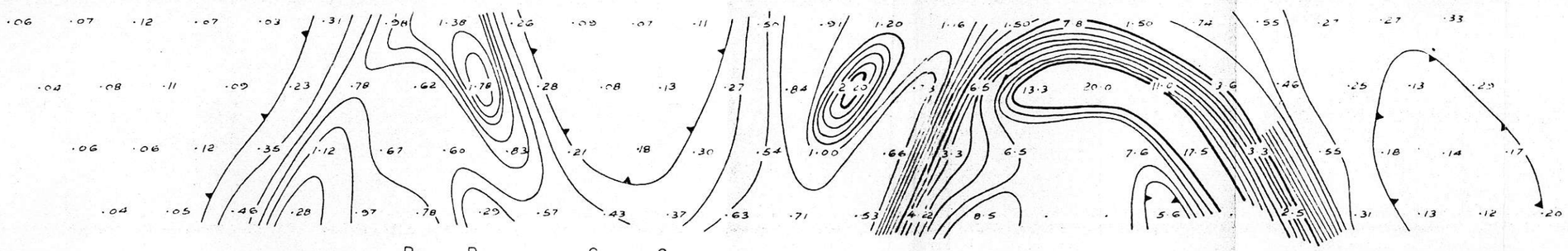
4SW 00 4NE 8NE 12NE 16NE 20NE



ρa

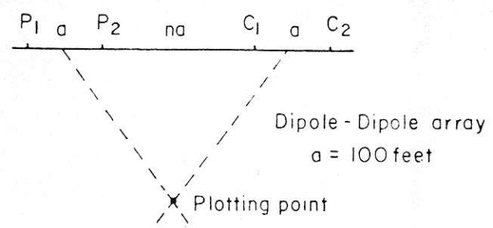
(ohm-metres)

4SW 00 4 NE 8NE 12NE 16NE 20NE



Normalized IP

$\left(\frac{Ma}{\rho a}\right)$



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CEDAR CLAIMS, LIKELY, B.C.

IP SECTION, LINE 56 NW

Scale 1" = 200'

DWG Nº E.I.C - 88

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