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REPORT ON MINING PROPERTY OF
NORTH STAR EXPLORATIONS, LTD., IN CARIBOU HEART RANGE

by: Wm.H. White, P.Eng.

July, 1966

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ATTACHMENTS

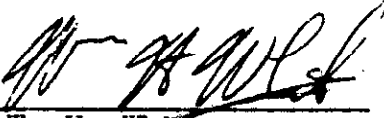
- Figure 1 - Structural Section #4
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and Geological Map

I.

DECLARATION

1. I am a registered member in good standing of the Association of Professional Engineers of the Province of British Columbia.
2. I have none but professional interest in North Star Explorations, Ltd., nor in its mineral properties.

(signed)


Wm. H. White

RECOMMENDATIONS

The mining property of North Star Explorations, Ltd., in the Caribou Heart range should be actively explored by surface trenching, geological and geochemical surveying, followed as predicated by initial results by diamond drilling. No type of geophysical survey is recommended at this time. A prime necessity for the layout of a detailed program of exploration is a geological and topographic map, and this should have first priority. Probably some claims can be dropped and others staked to cover extensions of the mineral deposits more efficiently. For the balance of this season a four-man crew of good hand miners should be employed to carry on surface trenching. Unless overburden becomes too deep, trenches should be excavated to fresh rock across the horizon of the main showing at intervals of from 100 to 200 feet. If it is found impossible to continue hand trenching, the crew could be employed in line-cutting in preparation for a geochemical survey.

Funds amounting to \$50,000 should be available for this season's work, and probably a like amount for next season.

On July 13th, 1966, guided by Mr. Robert Tait, the writer made a brief examination of copper showings on claims said to be owned or controlled by North Star Explorations, Ltd. The showings are on the southeast end of the Caribou Heart range, a small outlier of the Hogem Ranges, some 90 airline miles north-northeast of Smithers, B.C.

Present access is by air to a small lake near or on the property at elevation 4000 feet. However, from the head of Takla Lake to the property is only 25 miles across a gently-rolling, timbered terrain that would offer little difficulty to road construction.

According to G.S.C. Map 922A (McConnell Sheet), rocks on the property belong to the Upper Division of the Takla group, probably Lower or Middle Jurassic age, that includes marine sedimentary as well as volcanic rocks. No granitic rocks are shown on the map nor recognized in the vicinity.

Outcrops are scarce on this smooth south and southeast-facing slope of Caribou Heart range. The lower slopes are well timbered and at greater elevation the surface is mantled by heather and upland grasses. Indications are, however, that drift cover is not very thick. Copper mineralization is visible at two places where open cuts have been made. These workings are very shallow and neither reaches fresh rock.

MAIN SHOWING

The main showing, a little below timber-line, at about elevation 5200 feet, is at the lower extremity of a crescent-shaped scar of an old landslide. This is a bed about 20 feet thick of siltstone composed of thin alternating dark- and light-coloured layers. The rock is closely jointed and friable but evidently not folded nor metamorphosed. At the only place where its attitude could be measured the bed strikes a few degrees east of north and dips about 60 degrees eastward. The dip of the bed is roughly in the same direction as the more gentle inclination of the surface. The bed is concealed south of the main showing by drift and to the north by landslide debris.

Assuming regular upright structure, the siltstone bed is overlain to the east by light green clastic rock, possibly tuff. It is underlain in stratigraphic succession (exposed along the rim of the landslide scar) by 150 feet of dark-coloured, fine-grained clastic rock, possibly sub-greywacke; next by 200 feet of thick-bedded grey limestone; and finally by at least 100 feet of dark-coloured lava with trachytic texture and prominent plagioclase phenocrysts, provisionally called basalt.

At the main showing the siltstone bed is poorly exposed in a sidehill cut about 30 feet long oriented roughly normal to the strike. Throughout this distance the rock is copper-stained. Most joints carry very thin films of malachite

and hematite, but there is little or no limonite gossan. Copper sulphide minerals in the siltstone are in particles so small as to be almost invisible under a hand lens. However, microscopic examination of a polished specimen revealed the presence of bornite and chalcopyrite in ratio of about 4:1. Grains of highly irregular shape disseminated throughout the fabric of the rock range in size from 100 microns (1/10th mm) down to a few microns. No pyrite or other metallic minerals were observed.

Most of the exposure was too weathered to be sampled. However, a channel sample of reasonably fresh material was taken from the central part of the main showing representing 6 feet true width. This assayed[#]:

Gold, 0.005 oz/ton; silver, 0.20 oz/ton; and copper, 2.65%

Some 200 east of and downhill from the main showing veins up to $\frac{1}{2}$ -inch thick composed of native copper and calcite were found in landslide rubble blocks of basalt. The original position of this material must have been somewhere on the rim of the slide scar in the basalt unit. The native copper is probably supergene.

NORTH SHOWING

Some 1200 feet westerly from the main showing and at an elevation about 200 feet higher a small pit dug in the bank

of a shallow stream exposed rotten, broken, black siltstone or shale that showed some copper stain and, under the lens, a few particles of bornite. A grab sample of this material assayed#:

Gold, trace; silver, 0.40 oz/ton; and copper, 1.57%

Rock exposed in the nearby stream bed is a coarse-grained clastic rock, possibly an agglomerate, unlike any of the rock units associated with the main showing. Evidently this showing is separate from and not a repetition of the main showing.

CONCLUSIONS

These showings are the first discovery in B.C. known to the writer of sedimentary copper deposits. The type is well-known elsewhere - for example, the Kupferschiefer that has been mined for centuries at Mansfield, Germany, and the White Pine Mine, Michigan. Under very special conditions copper accumulated to economic grade in ancient marine sediments having great lateral continuity. Though very little is known of the deposits in the Caribou Heart range, they are of sufficient significance to warrant a good deal of study and exploration.

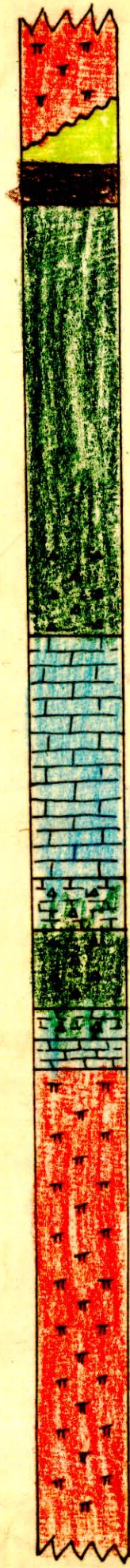
Respectfully submitted

July 30th, 1966


Wm. H. White, P. Eng.

Assayer: J.R. Williams & Son, Vancouver, B.C.

A



Andesite Porphyry

Shear Contact

Bright Green Altered Volcanic Rocks

Thin bedded black and grey Shale

contains disseminated bornite and chalcopyrite

Tuff and Volcanic Breccia

possibly some interbedded flows

Blue-grey Limestone

highly fractured, massive

Blue-grey Limestone with inclusions

of volcanic material

Volcanic Breccia - red and green fragments

Blue-grey Ls. - inclusions of volcanic material

Blue-grey Limestone - fine-grained, fractured

Andesite Porphyry

Some interbeds of non-porphyrific lava

Figure 1

STRUCTURAL SECTION

NORTH STAR COPPER

Vertical Scale: 1 inch = 50 feet

B

A. J. S.
Sept. 8, 1966

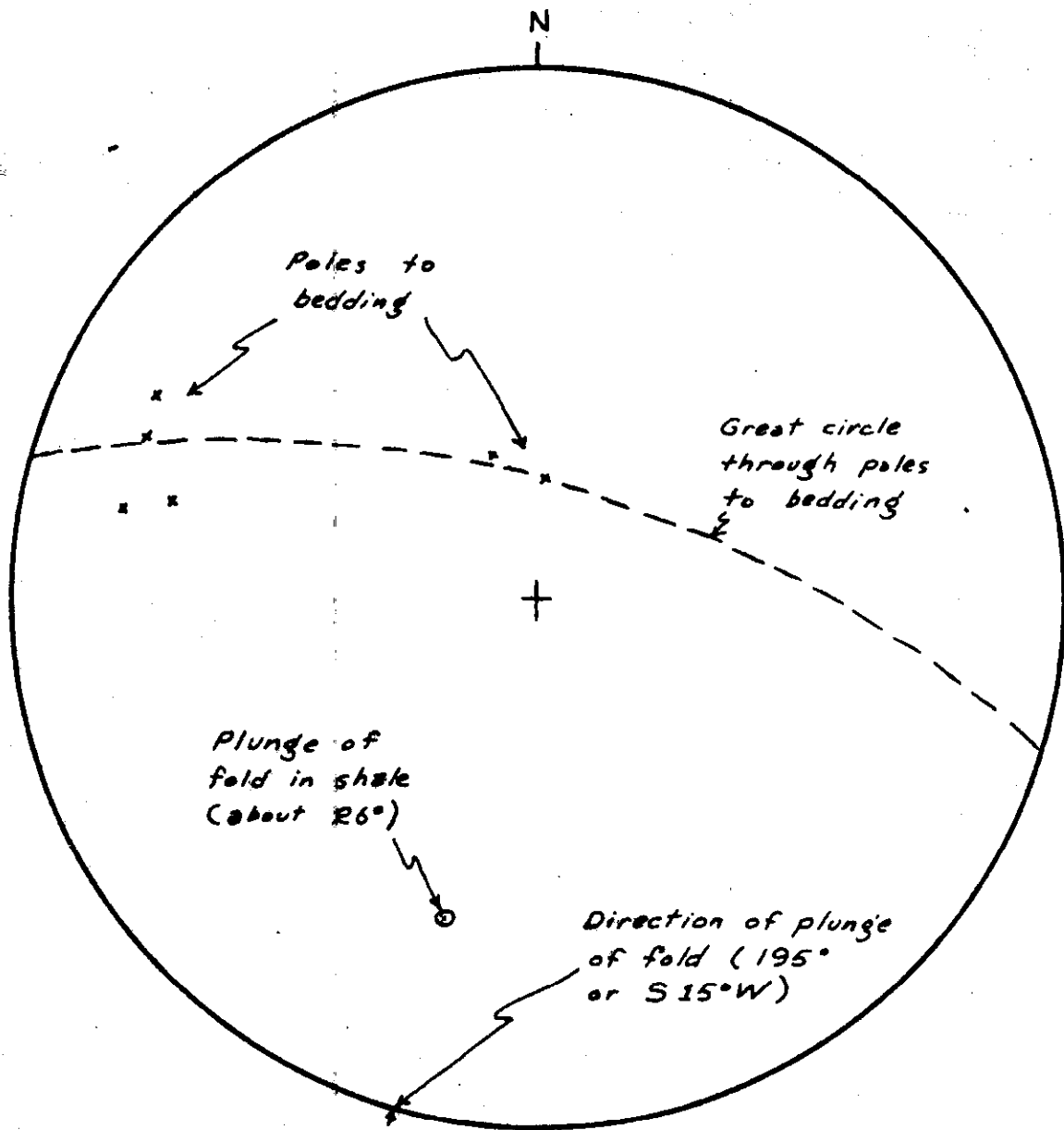


Figure 2

NORTH STAR COPPER

Poles to bedding in shale of main showing plotted on Schmidt equal area net indicate a plunge of 26° in a 195° direction for the small fold immediately south of the main showing

A. J. L.
Sept. 8, 1966

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FIGURE 3
NORTH STAR COPPER
CROSS SECTION A-B
(looking south)

Scale: 1 inch = 50 feet
horizontal = vertical

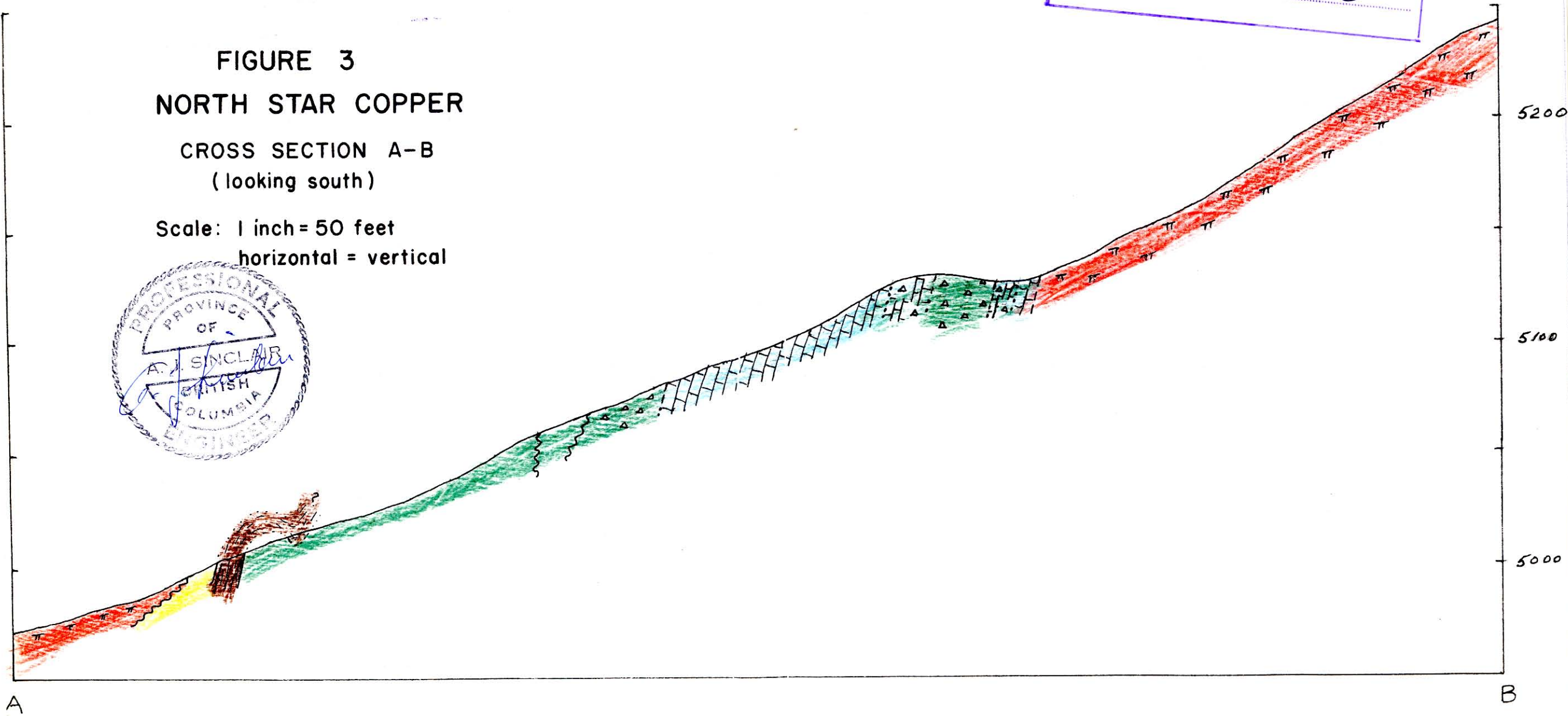


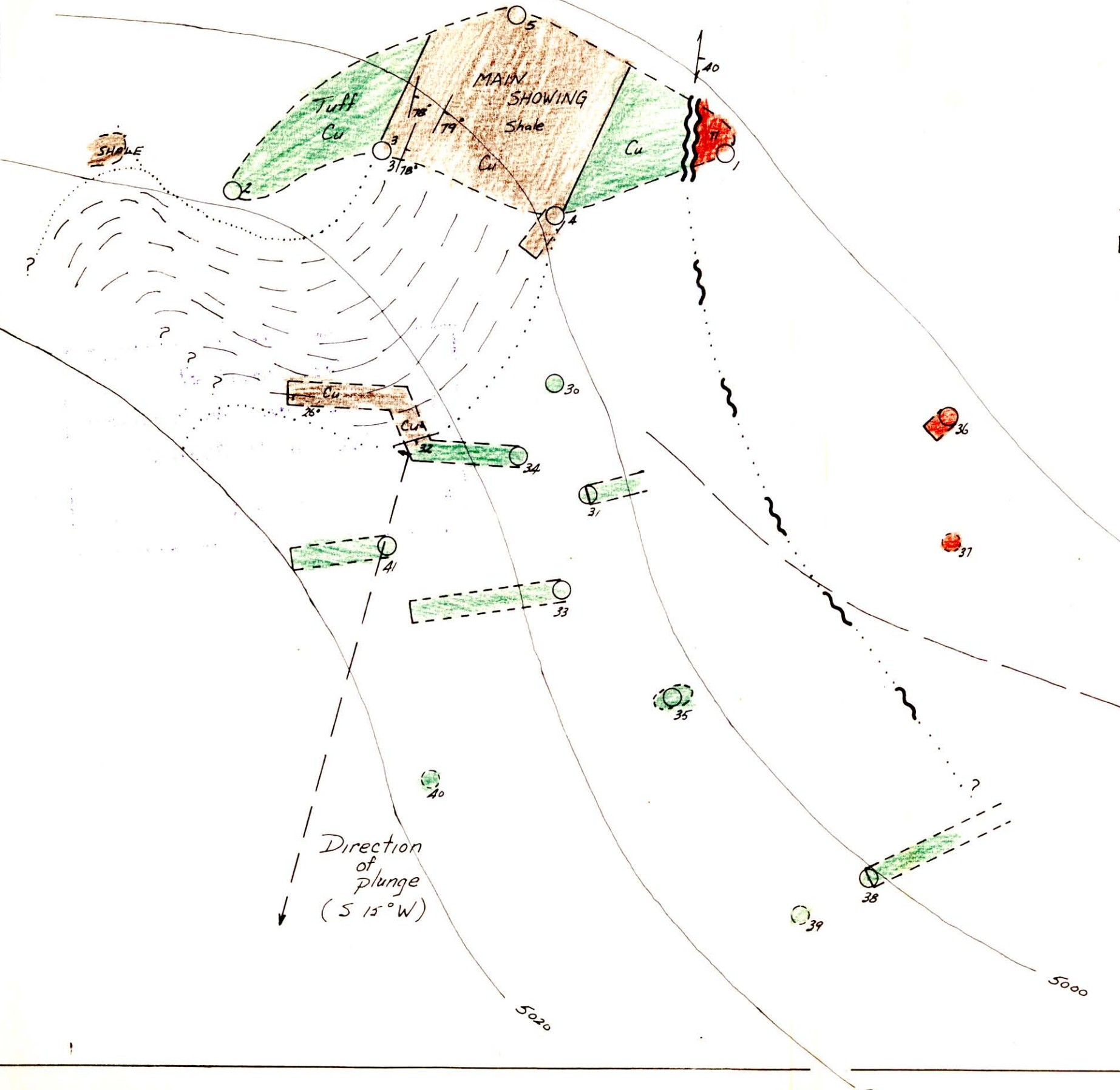
FIGURE 4
NORTH STAR COPPER

DETAIL OF AREA OF MAIN SHOWING
Rectangle on plate 1.
 SCALE: 1 inch = 10 feet

- LEGEND
- TUFF
 - SHALE
 - ANDESITE PORPHYRY

N (TRUE)

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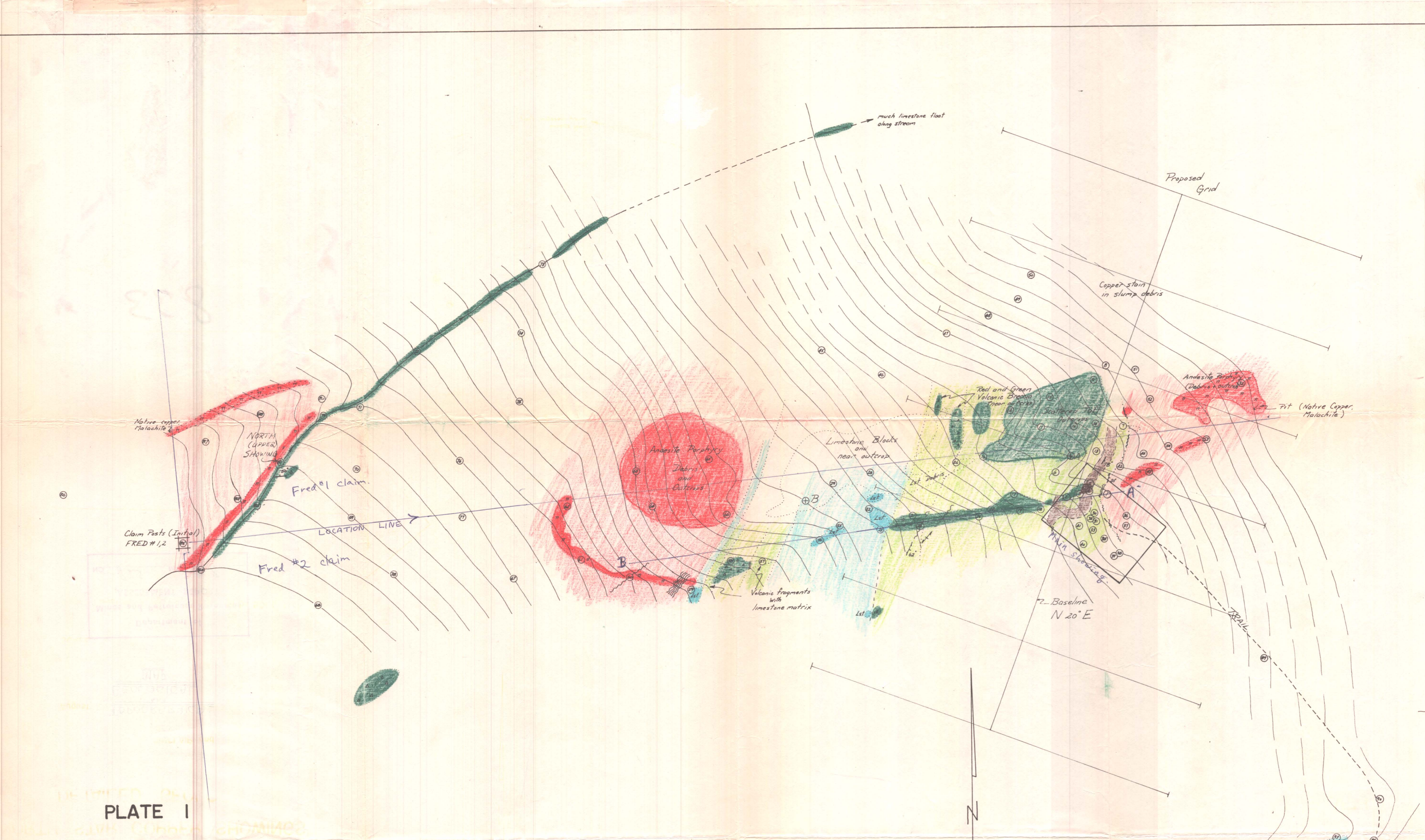


PLATE I

NORTH STAR COPPER SHOWINGS

DETAILED GEOLOGY

(PLANE TABLE)

GEOLOGY BY: A.J. SINCLAIR and R.D. MACDONALD
 August 30 to September 2, 1966

CONTOUR INTERVAL: 10 feet
 SCALE: 1 inch = 50 feet



Note: Elevation of station "A" taken to be 5000 feet

LEGEND

- Green Volcanic
- Shale
- Tuff / Breccia
- Limestone
- Andesite Porphyry
- Geological contact — observed, assumed, approximate
- Shear direction
- Bedding, tops unknown
- Trail
- Plane table station
- Area of outcrop or abundant small outcrops

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