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Marshall
Claim

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INTERIM PROGRESS REPORT ON EXPLORATION WORK
BY HIGHLAND LODGE MINES LTD. N.P.L. ON THE
MARSHALL CLAIM, GREENWOOD MINING DIVISION

INTRODUCTION

This report covers a summary of the exploration work and metallurgical studies carried out to date on the gold-copper deposit located on the Marshall Crown Grant in the Greenwood Mining Division.

As both exploration and metallurgical test work are still in progress, the conclusions given are somewhat tentative, but it is expected that the work accomplished during the next month will provide the information necessary to make an evaluation of the deposit and indicate the method of recovery of the economic minerals.

PREVIOUS PRODUCTION

Bulldozer stripping in 1966 exposed a gossan zone of heavy sulphides over an area of about 120 feet by 50 feet. Other, possibly parallel zones of gossan occur to the west of the pit. ¹⁰ From 1967 to the end of 1971 a total of ^{274?} 277 tons of sulphide ore was mined and shipped to the ^{194 tonnes} Cominco smelter of Trail. The average of all the shipments was 1.389 oz. Au and 1.56 oz. Ag. Copper was not assayed in all the shipments, but seems to vary from 0.5 to 10%. It is reported that the first three shipments in 1967 were hand cobbled ore, but the local two, totalling 177 tons were mined and loaded directly from the pit with a back hoe. The average of these two shipments was 1.55 oz. Au, substantially higher than the shipments of hand sorted ore.

EXPLORATION AND METALLURGICAL TESTING

A. Metallurgical Testing -

Test work on the sulphide mineral was initiated in April 1973. Two polished sections of typical massive sulphide were prepared and

submitted to J.A. Chamberlain Consultants Ltd. for microscopic analysis to determine if free gold was present and its association with the other minerals. Dr. J.A. Chamberlain, in a report dated April 19, 1973 stated that no free gold was noted at magnifications up to 1000 diameters. His conclusions were that the gold might be associated with the chalcopryrite or one of the other sulphides present and suggested an Electron Probe test.

Two further polished sections of typical mineral were prepared. The reject cut-off was sent for assay the following results:

Sample A - Au. 0.63, Ag 0.34

Sample B - Au. 1.35, Ag 0.88

Both samples were scanned by the electron probe at the U.B.C. Dept. of Metallurgy. The results of this work are contained in Chamberlain's report dated May 30, 1973. In summary, the probe, which tested each individual crystal of pyrite, chalcopryrite, and pyrrhotite exposed on the face of the polished section, and also scanned the entire face area of the specimen, indicated only a background gold content in any part of the specimen face. Chamberlain, in his conclusions, admits that the association of the gold in the mineral has not been determined, and suggests the next step should be a physical separation of the sulphides by flotation with an assay of each fraction, including the tails.

Pamicon Developments Ltd. has undertaken to carry out flotation separation tests on a typical sample. The material supplied for the test consisted of the combined rejects of four surface samples of sulphide which assayed respectively, 1.34, 0.3, 1.16 and 0.52 oz. of gold per ton or an average of 0.84 oz. It is intended to make separate concentrates of chalcopryrite plus any galina, pyrite, and pyrrhotite. The tails will

contain the silicious gangue and the remaining minerals such as magnetite and sphalerite, plus any free gold. These heavy minerals can be separated from the tails by panning. The gold assays of all the fractures should indicate the distribution of values in the original sample and point the way to the recovery method required.

B. Exploration Work -

During May 1973, nine percussion drill holes totalling 1,000 ft. were put down to test the zone from which the high grade ore had been shipped during the years 1967-71. The position, inclination, and depth of the holes are shown on the accompanying surface plan, and were aimed to probe a surface area about 50' x 150' to a depth of about 60'. The sludges were taken in 5' runs and visually logged as to sulphide content, then submitted for assay. Sulphide concentrations according to the logging are shown on the plan.

The assay results were erratic and inconclusive. There appeared to be no correlation between the percentage of total sulphides and the gold content, although previous sampling, both bulk and chip, indicated that the massive sulphides consistently carried high gold values. Shallow secondary enrichment can be ruled out, as samples of sulphides from the bottom of the pit returned as good or better assays than those taken from the surface.

It is the writer's opinion that the most probable explanation is that the gold occurs as thin flakes in minute fractures, and a large percentage of it floated off with the drilling water. (To substantiate this theory, it should be remembered that the atomic probe showed no appreciable gold

associated with the common sulphides; therefore, the gold must be associated only with the sparse minerals, e.g., galena, sphalerite, and magnetite, which is unlikely, or in the free state along minute fracture planes which, by random chance, were not intersected in the polished sections examined.)

There appears to be a gossan zone parallel to the main pit about 300 ft. to the west. Bulldozer stripping has exposed several zones of rusty sulphides bounded by limestone and greenstone.

Two chip samples of this gossan averaged 0.12 oz. Au. It is suggested that this zone should be opened up by drilling and blasting to obtain samples of sulphide from below the leached surface.

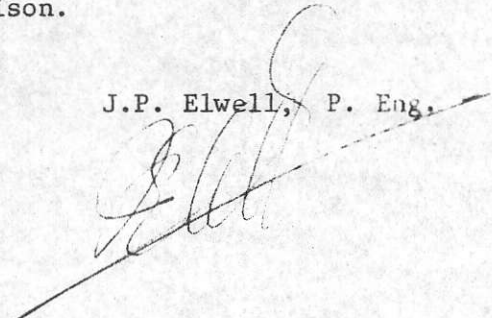
CONCLUSIONS

Although the metallurgical test work carried out on the polished sections failed to determine the nature and association of the gold, it has eliminated a number of possibilities and therefore should speed up and simplify the laboratory testing.

The method of drill testing of the sulphide zone must be revised. It is suggested that large diameter core drill holes should be put down close to and parallel to several of the percussion holes, with the same footage sections being assayed for comparison.

June 21, 1973

J.P. Elwell, P. Eng.



REFERENCES

Phoenix Property, Greenwood Area, B.C.

- R.G. Jury, P. Eng., April 4, 1973.

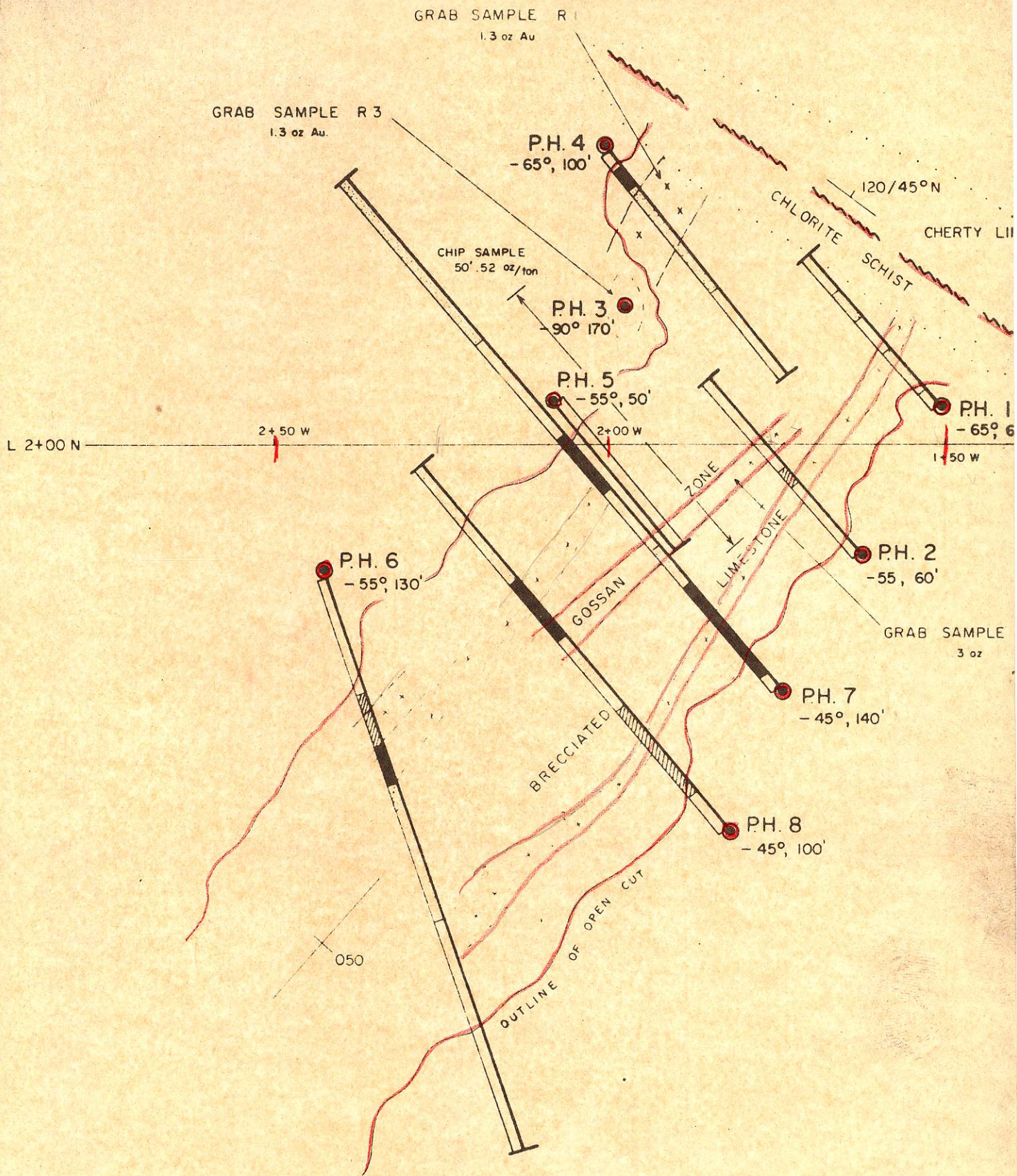
Ore Microscopy of Two Polished Sections

- J.A. Chamberlain Consultants Ltd., April 19, 1973.

Electron Probe Scan for Gold in Two Polished Sections

- J.A. Chamberlain Consultants Ltd., May 30, 1973.

Smelter returns from Cominco.



LEGEND



SULPHIDE MINERALIZATION



DRILL HOLE WITH SULPHIDE INTERSECTIONS

— MODERATE SULPHIDES

— GOOD — " —

— MASSIVE — " —



FAULT



OUTCROP BOUNDARY

BASE LINE

HIGHLAND LODGE MINES LTD. N.P.L.

PERCUSSION DRILL HOLE
AND SURFACE ASSAY PLAN
OF PART OF MARSHALL CLAIM

GREENWOOD MINING DIVISION, BRITISH COLUMBIA

