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REPORT ON THE
GEOCHEMICAL SURVEY
of the
ALPHA NORTHEAST & NORTH GROUPS
THE CARDIFF MINING CO. LTD.
HIGHLAND VALLEY, B. C.

January 28, 1957.

F.J. Hemsworth.

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REPORT ON THE
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INTRODUCTION

A geochemical survey was carried out on the Alpha Northeast and Alpha North groups of mineral claims in the Highland Valley for The Cardiff Mining Company Limited during the 1956 field season. Pedogeochemistry or soil testing was done in conjunction with magnetometer work as part of an exploration programme aimed at finding bodies of copper mineralization. Soil samples were tested for copper by the rubeanic acid method.

This report on the soil testing survey and the accompanying map are submitted in compliance with the Mineral Act claiming geochemical work for assessment purposes on the groups of claims outlined in the text of the report.

LOCATION AND PROPERTY

The Alpha groups are situated in the Highland Valley Copper Camp, in the Kamloops Mining Division, about 35 miles southeast of Ashcroft, B.C. The geographical position is latitude N $50^{\circ} 28'$, longitude W $120^{\circ} 58'$.

The Alpha Nos. 9-16 claims were staked by the writer for the company, and constitute an addition to the original Alpha-Scotty claims. After the claims were surveyed, the Alpha No. 5 fraction was staked for the company by F.W. Reger.

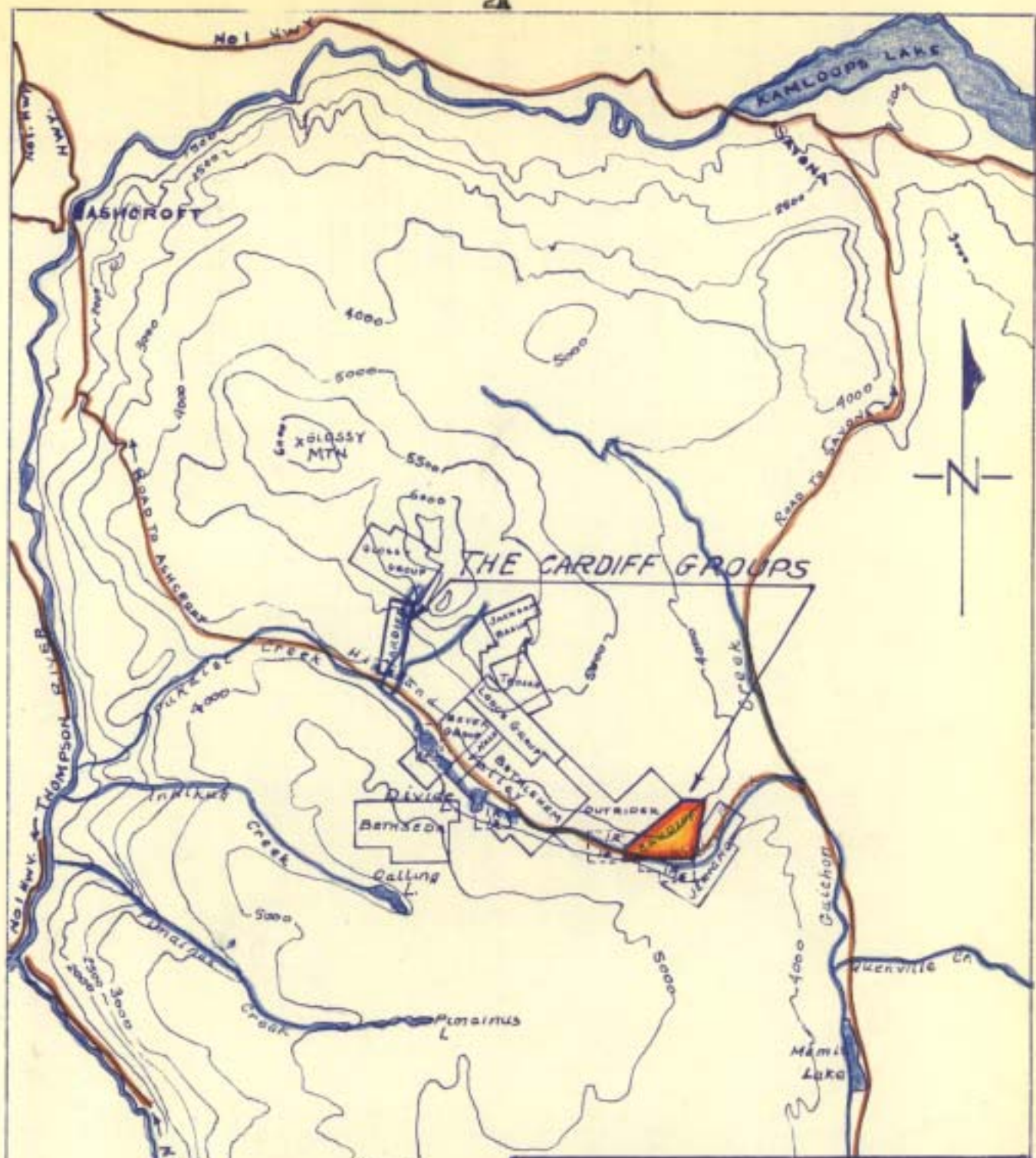
A list of the mineral claims which this survey covers is given below:

<u>Name</u>	<u>Date Recorded</u>	<u>Record No.</u>
<u>Alpha Northeast Group</u>		
Alpha No. 9	August 14, 1956	24384
Alpha No. 10	August 14, 1956	24385
Alpha No. 11	August 14, 1956	24386
Alpha No. 12	August 14, 1956	24387
Alpha No. 13	August 14, 1956	24388
Alpha No. 14	August 14, 1956	24389
<u>Alpha North Group</u>		
Alpha No. 5 Fraction	August 22, 1956	24464
Alpha No. 15	August 14, 1956	24390
Alpha No. 16	August 14, 1956	24391

GENERAL DESCRIPTION OF THE AREA

The Highland Valley is a generally southeast-trending valley having an average elevation of between four and five thousand feet (see included topographical map). It is drained by two creeks; the southeast half by Witches Brook which joins Guichon Creek, the northwest by Pukaist Creek which flows from Divide Lake northwest to the Thompson River.

The entire valley, except for some of the ridges that surround it, is covered by glacial drift. Near the creek bottom this drift achieves considerable depth. One diamond drill hole, drilled about one half mile southeast of the Cardiff property and next to the creek was reported to have cut over 250 feet of glacial overburden. All companies working in the Highland Valley agree that glacial overburden is the major hindrance to exploration.



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THE CARDIFF MINING CO. LTD.
 TOPOGRAPHICAL MAP OF
 HIGHLAND VALLEY AREA SHOWING
 APPROXIMATE LOCATION OF
 MAJOR CLAIM GROUPS.
 SCALE 1" = 4 MI.

NO. **148** MAP #1 To ACCOMPANY REPORT BY F.J. HEMSWORTH

F. J. Hemsworth

The Highland Valley is serviced by a dirt road, maintained by the Department of Public Works, that runs from Ashcroft through the valley to Merritt.

DESCRIPTION OF CARDIFF PROPERTY

The Alpha northeast and north groups lie north of Indian Reserve No. 15. They are bounded on the south and west by the Alpha and Scotty groups, on the north by "Duvan" claims and on the east by the Jericho Mines claims. The terrain rises gradually to the north. The property is cut by a few south-trending gulleys, which are the result of glaciation or old water courses, but for the most part the surface is comparatively even. Except for the upper end, the area of the claims is almost entirely covered with overburden. A quartz diorite ridge outcrops intermittently at the top or north part of the property.

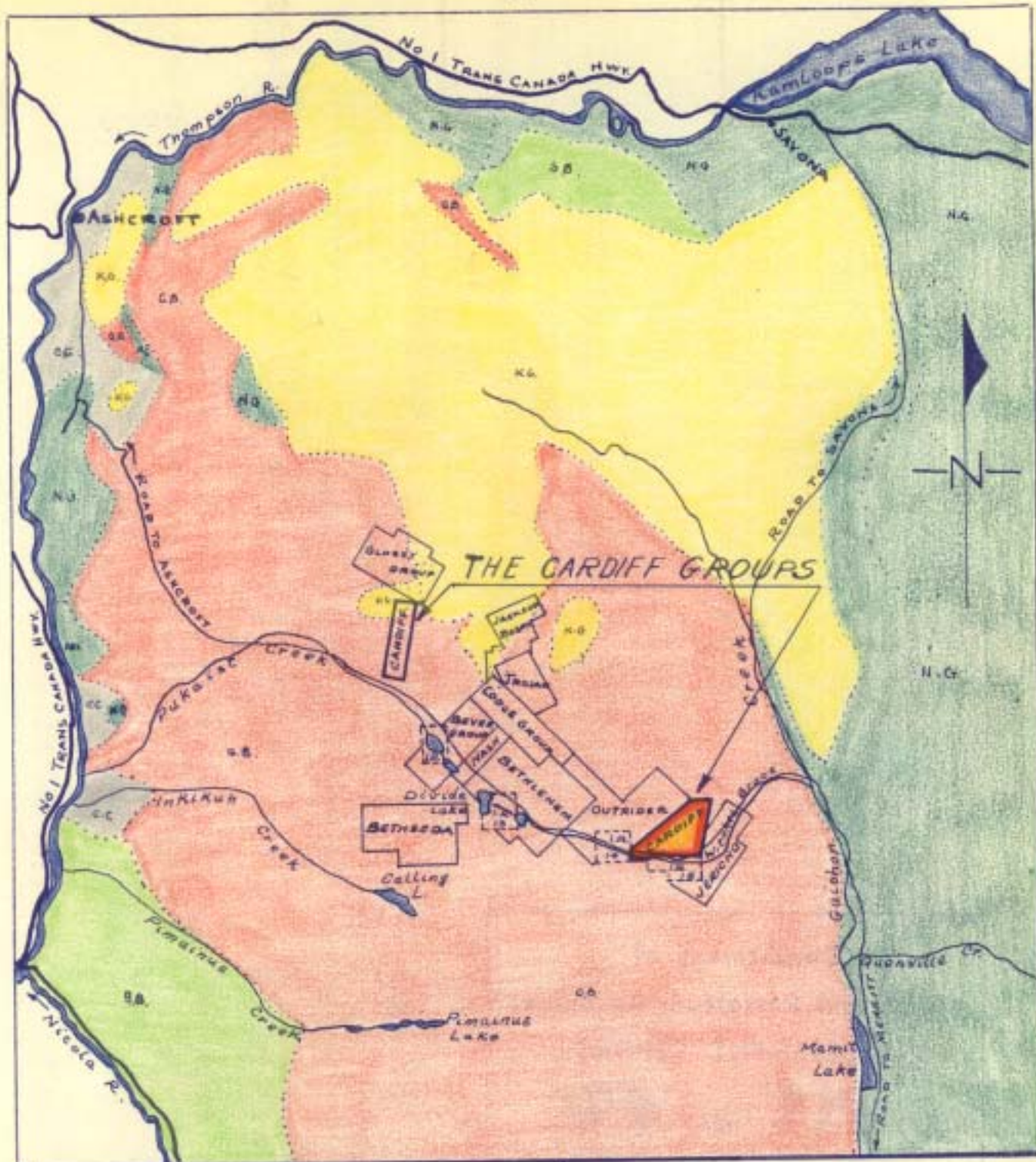
LOCAL GEOLOGY

The depth of overburden on the majority of properties in the Highland Valley area makes structural determination very difficult. The only outcrop on the Cardiff group appears to be quartz diorite with a little larger percentage of hornblende than is usual. A jointing system over a east-west distance of some 600 feet has a north-south trend and dips between 60° and 70° east. A mineralized shear on the south side of the valley on the Jericho property has a similar strike and could possible line up with this jointing system. Witches Brook might represent a geological feature but there does not seem to be nay proof for this.

GEOCHEMICAL SURVEY

Survey of Grid

The claim location lines were surveyed with a transit and chain and tied in to the corner post of Indian Reserve No. 15. An east-west



—LEGEND—

KAMLOOPS GROUP: Recent volcanics; basalt, rhyolite, andesite.

K.G.

SPENCE BRIDGE GROUP: Hard reddish lava.

S.B.

GUICHON CREEK BATHOLITH: Granite granodiorite, quartz diorite.

G.C.

NICOLA GROUP: Greenstones, agglomerates, minor argillites, limestones.

N.G.

CACHE CREEK GROUP: Greenstones chert, minor limestones.

C.C.

THE CARDIFF MINING CO. LTD

GEOLOGICAL MAP
OF
HIGHLAND VALLEY AREA
FROM
MAP 1010A, ASHCROFT SHEET
SCALE 1" = 4 MILES

TO ACCOMPANY REPORT BY F. J. HEMSWORTH.

F. J. Hemsworth

baseline was surveyed along the south boundaries and picket lines were run north at 300-foot intervals. Stations for the soil samples were marked at 200-foot intervals along the picket lines. Stations were designated 42/28, meaning 4,500 feet west along the baseline and 2,800 feet north.

Soil Sampling Method

At the station intervals (200 feet) a shallow hole was dug with a garden trowel. The hole was deep enough to get below the surface humus. The soil samples were taken at a regular depth of 6 inches. Two tablespoons of soil were placed in a cellophane bag, sealed with scotch tape, labelled, rolled up and secured with an elastic band. Samples were carried back to camp in a small packsack.

Spot Tests for Copper - Testing Method

The tests were made on a crude table at the main tent camp. These tests could have been done in the field but this would lead to slower and less accurate work. The following is a description of the procedure used in making the tests.

A 1 inch strip of rubeanic acid paper was placed in the beaker so that the tip of the filter touched the centre of the rubeanic acid paper in the bottom. A $\frac{1}{4}$ teaspoon of soil was measured from the sample into a test tube; 1 teaspoon of extracting solution was added. The test tube was corked and the mixture shaken for 20 seconds. The mixture was then poured into the beaker filter and allowed to stand for a few minutes. The rubeanic acid paper showed a blue spot indicating the presence of copper, the intensity of the blue color being proportionate to the amount of copper present.

The extracting solution was made up by mixing together 1 part acetic acid, 1 part water, and 2 parts of a 25% solution of sodium acetate.

It was found that care was essential in measuring out the exact quantities of soil and solution, as the same amounts of copper will be spread in quite a different fashion according to the concentration of solution. Plastic measuring spoons which are cheap and readily available were found ideal for the purpose.

Certain standard tests were made at the University Laboratory from field samples to determine the number of gammas of copper which filtered through. Quantities were delivered by microburette from a solution of the concentration indicated on the acid paper strip. About 5% of the liquid passes through the reagent paper if the test has been done properly, up to 7% if too much liquid is added. The amount and length of delivery of solution were made to simulate conditions in the field. Using $\frac{1}{4}$ teaspoonful of soil (about 1 gram) and 1 milliliter buffer, about 0.05 ml filters through. Analyses gave the amount of copper extractible by acetic reagents in gammas, or micrograms per gram. Parts per million were obtained approximately by multiplying the number of gammas by 20.

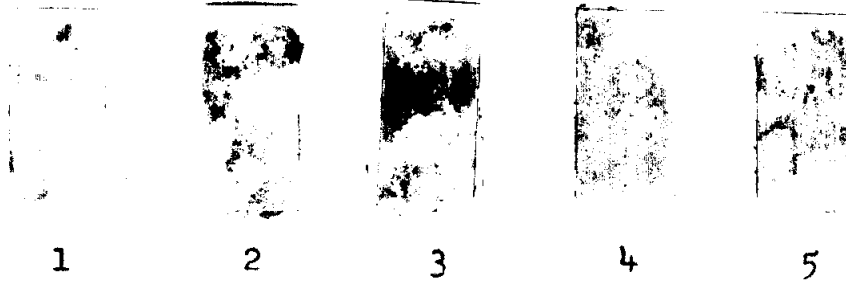
MAPPING

The strips of acid paper showing the varying degrees of blue spots were pasted on a map of the claims. This method was useful for visual checks but unwieldy for reporting the results. Consequently arbitrary numbers were chosen from 1 to 5 to designate the degree of blue color intensity, which in turn represented the amount of copper extracted. These are shown on page 6. The results vary from about 0.01 gammas or .2 parts per million up to .5 gammas or 10 p.p.m. Of course this is only a small part of the total copper or the copper extractible by stronger reagents.

Amounts below 0.02 gammas or 0.4 p.p.m., as represented by Nos. 1 and 2 on the map are practically negative and can not be expected to have any significance. Spot tests ranging from 0.4 to 10 p.p.m. and represented by numbers from 3 to 5 on the map, may have some significance but are difficult to interpret unless maximum concentrations occur as fans or haloes.

Spot tests for copper with rubeanic acid paper

Color standards for mapping



- 1 Blank: Filter paper always retains some copper; it would be very expensive to obtain perfect blanks.
- 2 Very low: Probably heavy mantle of glacial overburden.
- 3 Medium background: Stronger than usually found on glacial drift; probable vicinity of rock.
- 4 Stronger than usual: Possibly near weak copper mineralization.
- 5 Strong: Some copper mineralization in the vicinity, possibly low-grade or small amount or water containing copper.

CONCLUSION

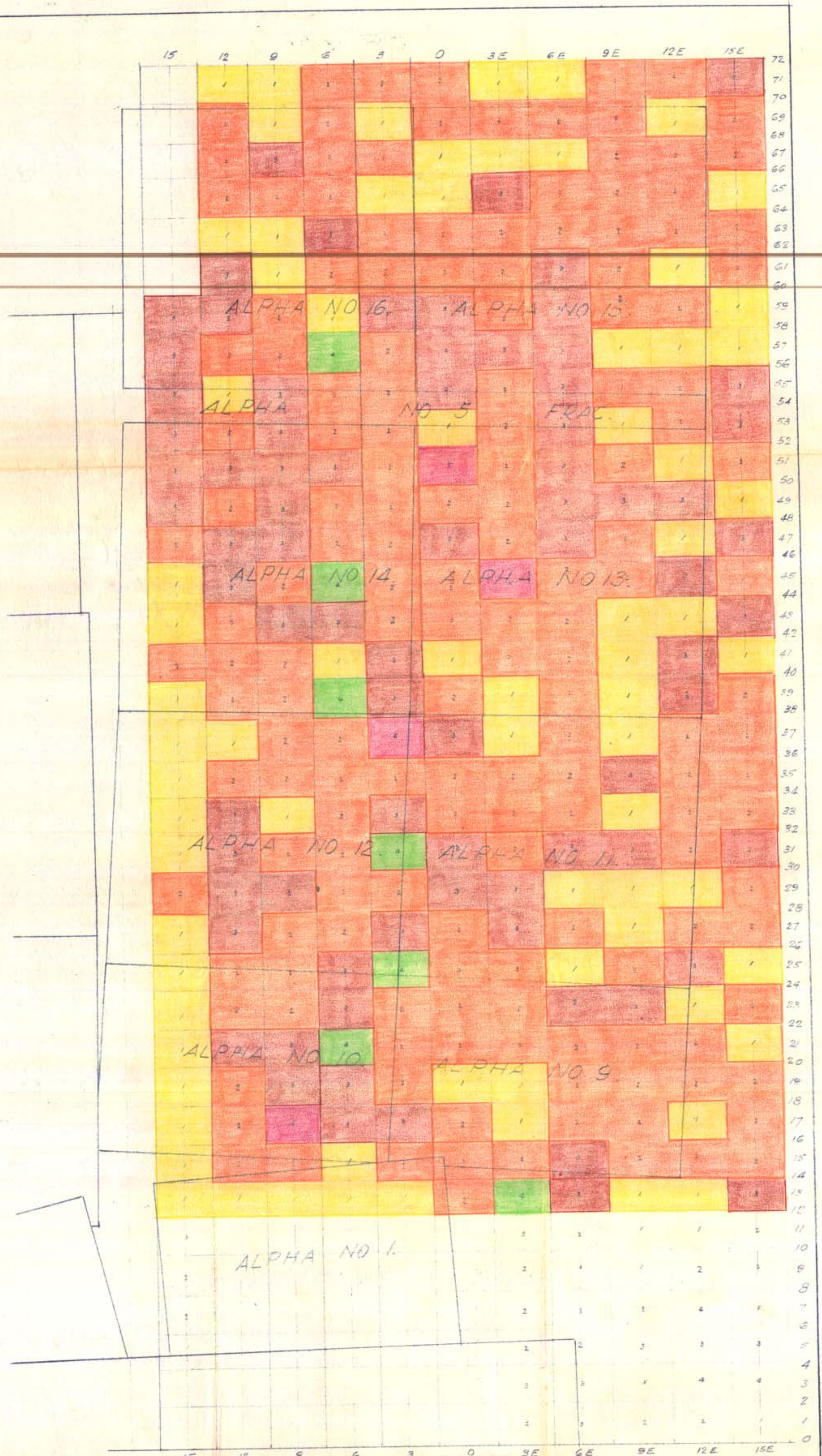
Isolated highs were found but no pattern of anomolous values which could be contoured rationally. The results were patchy with a few isolated highs showing up. Haloes or anomolous conditions which might reflect or suggest the presence of orebodies were not evident.

The glacial drift in the southern and southeastern part of the map area was unusually thick, so much so that soil sampling could not be expected to produce conclusive results. It must be stated that the results of this geochemical survey were negative.

However, the absence of positive results on this survey does not preclude the possibility of copper mineralization in the underlying subsurface rocks.

Respectfully submitted,


F.J. Hemsworth, P. Eng.



SOIL SAMPLES
 SPOT TESTS FOR COPPER
 GRAPHIC LEGEND FOR MAP.

- 1 BLANK.
- 2 VERY LOW.
- 3 MEDIUM.
- 4 STRONGER.
- 5 STRONG.

ABOVE NUMBERS CORRESPOND TO
 NUMBERS SHOWN ON COLOUR
 STANDARDS IN THE ACCOMPANYING
 REPORT.

THE CARDIFF MINING CO LTD.

PLAN OF
 GEOCHEMICAL SURVEY
 UPON NORTHEAST & NORTH
 CLAIMS - (ALPHA 9 TO 16 ETC)
 AT HIGHLAND VALLEY, KAMLOOPS
 DIVISION, BRITISH COLUMBIA.

SCALE: 1 INCH = 300 FEET.

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 149 MAP #3

TO ACCOMPANY REPORT OF
F. J. Hensworth
 F. J. HENSWORTH; P. ENG.

#149
 MAP3

DEC 20TH 1956