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Copy of this loaned to P. Stevenson on June 25/68. plus colored copy of Snowshoe map.

801096

President and Directors,
Buval Mines Ltd., (N.P.L.)
#201-535 Thurlow Street,
VANCOUVER 5, B.C.

July 10, 1967

Attention: Messrs. D. W. Small
and W. D. Yorke-Hardy

Gentlemen:

GEOLOGICAL REPORT
FLEET AND L.L. PROSPECTS
BUVAL MINES LTD., HUDSON BAY MTN. PROPERTY,
SMITHERS, B.C., OMINECA MINING DIVISION

INTRODUCTION

This report summarizes the essential geological features of the FLEET and L.L. mineral showings situated within the northwesterly part of the Company's expanded Hudson Bay Mountain mining property. It also contains the writer's recommendations, with estimated costs, for general and local exploration of the respective vein -, and disseminated - type mineral showings.

The writer's personal knowledge of the local geology derives from his June and September, 1966 examinations of the Zobnic and Snowshoe prospects - both representative of the vein-type mineralization occurring within the Simpson Creek section of the mountain.

To date, both the Fleet and L.L. mineralization have been only superficially explored by a few hand-excavated pits and trenches and, with respect to the first-named prospect, also by three relatively short drift-adits and a shallow shaft on distinctly separate segments of the vein. As nearly all of the above work was accomplished prior to 1930, sluffed material presently obscures old trenched exposures and partly, or completely blocks the former adits. Hence, descriptions contained in the following text largely originate from successive annual reports of the Minister of Mines and other Provincial and Dominion Government publications. These, particularly in regard to property details and new showings, have been supplemented by data kindly provided by Mr. Yorke-Hardy; the writer thankfully acknowledges the latter's very helpful contributions.

This report is intended as a supplement to the writer's February, 1967 geological report "HUDSON BAY MTN. PROPERTY, BUVAL MINES LTD., N.P.L."

Drawing No. 4; "FLEET and L.L. GROUPS - CLAIMS, TOPOGRAPHY, AND MINERALIZATION" supplements the text of this report.

PROPERTY

Fleet Group: This consists of a square block of 4 claims comprising the Fleet, Fleet No's 1, 2 and 3. This group includes the ground and showings formerly covered by the Empire, Heather, and contiguous claims; the group was located in 1959.

Duval Mines Ltd., submitted a letter of intent to option the ground from Messrs. F. W. Coles, J. Hamelspeck, and C. E. Glover on May 1, 1967.

Schedule B - appended, and which is compiled from the Company's records, provides full legal details of location, record, ownership, and option.

L.L. Group: This consists of an essentially square block of 34 claims, located by L.B. Warren, Smithers, B.C. on behalf of a jointly-participating group comprised of L. B. Warren, A. J. Cope and W. Gardiner. The group was generally staked between April 1 - 27, 1967.

Duval Mines Ltd. negotiated an option for the property in early June, 1967.

Schedule C - appended, also derived from the Company's records, provides formal/legal details of location, record, ownership, and option arrangements.

LOCATION AND ACCESS

The general location of the Duval Mines Ltd, Smithers, B.C. property, and constituent claim groups, is given in the writer's February, 1967 report.

The Fleet group is situated closely north of the Midnight group; and straddles the south fork of Simpson Creek above the 4500-foot elevation. It is accessible by way of the old Simpson Creek trail or, alternatively, via helicopter from the base near Smithers - roughly 6 miles distant.

The L.L. group occupies the northwesterly corner of the general Duval claim group. More locally, it is situated along, and to the east of the headwaters area of Miller Creek - generally between the 4500' - 5500' elevations. The showings are relatively easily accessible by way of the Sil-Wan and Ski Hill roads; thence by about 1½ miles of northerly-branching trail. Also, the showings are situated about 5 air-miles west of Smithers.

HISTORY

The Empire-Heather vein showings form a principal target of the proposed 1967 exploration program. These are presently included within the Company's 4-claim Fleet group.

The Empire Au-Ag-Pb-Zn vein showings were discovered and staked by the Simpson brothers of Smithers in 1903, and D.C. Simpson intermittently explored these during the next 30 years.

The Heather vein mineralization was staked by H.C.Wade in 1931; the adjacent Dorothy showings were also located about this time.

Old records suggest that past production comprised a few tons of sorted, high-grade ore - this being hand-mined and horse-packed to the railroad.

The present Fleet group, including the former Empire-Heather showings and the general section of ground containing these, was located by Messrs. Cole and Glover in 1959. Subsequent exploratory work consisted of trench exploration of some showings situated near creek level; this is reported to have been accomplished during 1964-65.

The L.L. group includes an area of possible disseminated Cu-Mo mineralization which, to date, has been only very slightly prospected.

WORKINGS

Of the various mineral occurrences contained within the boundaries of the Fleet group, the old Empire showings - these straddling Simpson Creek S. fork - have been most extensively explored.

The Empire 'North' vein has been explored by a number of trenches, and also by a 40-foot adit at the 4700 elevation. A second cross-cut adit, located 50 feet southeast and 25 ft. below the upper portal, was driven only 15 ft; this was not advanced far enough to intersect the vein.

The 'South' vein has been prospected by trenches and, at 4725 elevation, by a 70-foot crosscut adit and 135 feet of drifting. The vein was additionally explored by a 50-foot drift adit and a 10-foot shaft at 5200 elevation.

The 'West' shear zone has been only slightly explored by a few small surface cuts.

The Heather shear vein has thus far been explored by two open cuts near the crest of the ridge between the forks of Simpson Creek.

GENERAL GEOLOGY

The Simpson-Millar Creek section of the mountain is predominantly underlain by andesitic flows and fragmentals of the Hazelton volcanic group. Closely east of the Empire showings these have been intruded by an apparently small diorite stock. However, the conspicuously interrupted and, locally, arcuate pattern of certain veins within the volcanics enclosing the stock suggests that only a fraction of its full surface extent is exposed, or that it could enlarge rapidly with depth. Similarly, the occurrence of (mineralized) granite float of rather evident local origin within the L.L. group, suggests the existence of a generally concealed granite stock in this general area. These occurrences are significant in that they suggest a greater extent of subsurface intrusive activity than the few, but predominantly volcanic bedrock exposures would indicate.

The southeasterly-trending felsite porphyry dyke and fracture swarm, which constitutes a principal lithologic-structural feature of the major climax MoS2 zone on Glacier Gulch, strikes towards the general Jessie-Empire-Snowshoe locality. It is possible that the Yukon granitic, and Empire dioritic stocks also represent

extensions of intrusive activity to the southeast along this indicated structural zone. Some geologic substantiation of this inference is provided, additionally, by the occurrence of higher-temperature arsenopyrite mineralization (significantly; also occurring 1000 feet east of the Glacier Gulch Mo32 zone and buried granodiorite stock) within the upper Simpson Creek locality.

The principal mineralization of the upper Simpson Creek area consists of simple to complex associations of argentiferous galena and sphalerite, and gold-silver bearing sulfo-salts and arsenopyrite within quartz veins and variably-silicified shear zones. These structures strike within the general N - NW quadrant. Locally they are interrupted and/or offset by transverse faults.

The minor amount of exploration so far accomplished over the several individual vein segments has tested only the relatively accessible, near-surface horizons of these structures.

LOCAL GEOLOGY & MINERALIZATION:

A. EMPIRE (FLEET GROUP)

The 'North' vein, presently explored over a few hundreds of feet to the northwest of the south fork of Simpson Creek, occurs within andesitic flow breccias. It strikes N55°W and dips 60° SW. Mineralization consists of argentiferous galena and sphalerite with variable proportions of quartz and broken, siliceous wall rock. Minor amounts of chalcopyrite and pyrite occur with the other minerals. At the 4700-foot adit a 12-inch cut sample across this well mineralized vein section is reported at Au, 0.08 oz/ton; Ag, 18.90 oz/ton; Pb, 18.2%; and Zn, 16.6%. The vein was exposed for 40 feet to the northwest in this adit, where it pinched towards the face. On dip, at least within the outer part of the adit, it evidently widens with depth.

The 'South' vein, also occurring in andesitic volcanics, and associated with a pronounced shear, strikes S.35°E for 600-700 feet up the steep south slope of the Simpson Creek basin. Wall rocks are characteristically bleached to buff shades, adjacent to the shear. Locally, the altered zone contains stringers of Pb-Zn sulphides with, or without replacement pyrite within the altered rock between these stringers; with this, an appreciably greater mineable vein width is indicated.

A grab sample taken from a small heap of vein material at the 4725 adit portal is reported to have assayed: Au, 0.03 oz/ton; Ag, 7.45 oz/ton; Pb, 7.17%; Zn, 4.31%.

Within the 5200 adit-drift and shaft, the shear contains bunches of galena and sphalerite, with a narrow streak of massive sulphides in the shaft. A specimen sample by the Dominion Government geologist assayed: Au, 0.06 oz/ton; Ag, 207.0 oz/ton; Pb, 25.3%; Zn, 18.6%.

A third showing, herein termed the 'West' shear, occurs near the head of the South Fork basin at elevation 5200 feet. It is described in the 1929 Annual Report of the Minister of Mines as follows:

"It consists of a wide zone in volcanics, striking north-south and dipping west, mineralised with galena and sinchlende. Very little work has been done, but the zone can be traced on the surface for a considerable distance, and it is claimed that there are good showings farther up the mountain -- a sample from a small cut across 24 inches of vein matter assayed: Au, 0.30 oz/ton; Ag, 6.0 oz/ton; Cu, 1.0%; Pb, 23.2%. Another sample from a small cut about 700 feet north, across a stringer 5 inches wide, assayed: Au, 0.76 oz/ton; Ag, 7.0 oz/ton; Cu, 1.0%; Zn, 23.4%. This zone appears to merit further exploration."

B. HEATHER SHOWINGS

A 4-foot shear zone, striking northerly and dipping westerly, is exposed by two open cuts near the crest of the ridge separating the forks of Simpson Creek.

Mineralisation consists of arsenopyrite and sphalerite across widths approaching 3 feet. A cut-sample by the government geologist assayed: Au, 0.10 oz/ton; Ag, 0.3 oz/ton; Zn, 3.4%. In view of the presently exposed and indicated grade of mineralisation, this vein is considered to be a less urgent exploration target within the currently proposed program.

C. L.L. SHOWINGS

Mineralisation consists of dispersed Cu-Mo-Fe sulphides in fractured volcanics. Locally, disseminated mineralisation in granitic float has been noted; however, the bedrock source - believed to be in this general locality - has not been found to date.

The results of recent sampling by L. Warren, prospector-vendor, are as follows:

Location	Width & Type	Au, oz/ton	Ag, oz/ton	Cu, %
Cu (Mo) Zone - 1A	5' chip	trace	0.10	0.48
Cu (Mo) Zone - 2A	5' chip	-	-	0.11
Fe pyrite Zone - 3A	5' chip	trace	0.10	0.03
Cu (Mo) Zone - 3C	Grab	-	-	0.81
Spectro Assays:				
Cu Zone	Grab	trace	trace	1.18
Float, ½ mi.	Grab	-	-	0.02
Rhyolite, Fe pyrites	-	trace	trace	tr.

The indicated L.L. mineralized zone occurs within a relatively little-explored part of Hudson Bay Mtn.; this section lies southward and closely adjacent to the focal Climax property - although bedrock is largely concealed by overburden, the occurrence of significant amounts of chalcopyrite, dispersed in trench granitic and volcanic bedrock material and float fragments over a currently explored 800 x 1000 foot area, indicated an important bedrock mineral potential.

The general association of the above mineralisation within both granitic and volcanic host rocks provides the optimum geological setting for a possible major zone of dispersed mineralisation such as occurs within the Climax zone in Glacier Gulch to the north of the L.L. group. Although the L.L. property constitutes an essentially raw prospect, the writer considers it as one which merits a thorough and comprehensive program of general exploration.

SUMMARY

Buval Mines Ltd., Fleet and L.L. groups are recent property acquisitions which add a 38-claim area to the northwesterly section of the Company's extensive group on Hudson Bay Mountain. The new claims, lying closely south of the Climax group, include probable southeasterly extensions of the Glacier Gulch fault-vein system. In addition, the L.L. and Fleet mineralisation appears structurally and, possibly, genetically related to the main body of granitic rocks which are believed to form the core of the mountain.

The smaller 4-claim Fleet group, situated within upper Simpson Creek and Basin, contains three distinct, but only superficially-explored vein segments. All of these lie closely west of one of the few bodies of intrusive rock outcropping on the mountain; they also strike northwesterly towards the general zone of vein and stockwork mineralisation of the Glacier Gulch area.

The 'North'vein mineralisation consists of argentiferous galena and sphalerite, and minor chalcopyrite in quartz and broken silicified andesitic wall rocks. A few hand-cuts and a 40 foot drift comprise the total exploratory work to date. A 12-inch cut sample across the adit portal assayed Au, 0.09 oz/ton; Ag, 18.90 oz/ton; Pb, 18.2% Zn, 16.6%; Cu, not assayed.

The 'South' vein, associated with a pronounced shear, has been traced over a 600-700 foot strike - interval by means of a few widely-spaced hand-cuts and two short drifts. No trench samples are reported; however, a grab sample of piled vein material at the lower adit assayed: Au, 0.035 oz/ton; Ag, 7.45 oz/ton; Pb, 7.17%; Zn, 4.31%.

A sample of high-grade sulphides from a small shaft at the 5200 elevation assayed: Au, 0.06 oz/ton; Ag, 207.0 oz/ton; Pb, 25.3%; Zn, 18.6%. In addition the highly-bleached volcanic wall rocks are fractured with appreciable stockwork Pb-Zn mineralisation - significantly adding to over-all potential mining widths.

The 'West' zone comprises a wide zone of shearing and veining within the local andesitic volcanics. This structure, tentatively delimited on strike for several hundreds of feet, has been very superficially prospected by a few hand trenches and rock cuts. From one cut a 24-inch sample by the examining government geologist assayed: Au, 0.30 oz/ton; Ag, 6.0 oz/ton; Cu, 1.0%; Pb, 25.2% - the gross value of this amounting to $98.00 per ton. This constitutes a potentially mineable grade of material over larger, normal stoping widths, expectable metal recoveries, and net smelter returns.

The fourth, or 'East' vein has been exposed by only two open cuts. The general shear zone, averaging 4 feet in width, contains a 3-foot section of arsenopyrite - sphalerite mineralization. A trench sample of this material is reported at Au, 0.10 oz/ton; Ag, 0.5 oz/ton; Zn, 3.4%. The general proximity of the vein to an inferred underlying diorite stock provides considerable incentive for significantly deeper exploration.

Recent preliminary trenching on the L.L. Cu (Mo) mineralized zone has so far delimited a general 800 by 1000 foot area with fracture-filling and disseminated chalcopyrite in well altered volcanic and, possibly, granitic host rocks. The presence of the latter, under the generally prevalent overburden, is deduced from the occurrence of well-mineralized float fragments of apparent local origin. Samples from the recently trenched Cu (Mo) zone grade from 0.11 to 0.81% copper. The L.L. geological setting and mineralization are, in several respects, similar to that of the general Climax zone lying some 2 miles northerly; hence, a comprehensive program of general exploration on the L.L. group is specifically recommended.

RECOMMENDATIONS

A. Carry out general geological mapping of the Fleet and L.L. mineralized areas.

B. Conduct preliminary geophysical (E.M.) and geochemical exploration over presently-indicated Fleet and L.L. mineralized zones and areas.

C. Strip and/or trench indicated mineralized zones within the Fleet and L.L. claim groups.

D. Rehabilitate portal sections of Fleet group tunnels to allow geological mapping and sampling.

E. Explore Fleet group veins at depth by diamond drilling; drill indicated mineralized zones on L.L. group for geological information.

Duval Mines Ltd., (N.P.L.)

ESTIMATED COSTS

A	Geological mapping & sampling	
	1. Fleet group .....$ 500.00 2. L.L. group..... 1,500.00	$2,000.00
B.	Provision, preliminary geophysical - geochemical exploration	
	1. Fleet group.....$ 500.00 2. L.L. group..... 2,000.00	2,500.00
C.	General stripping & trenching	2,500.00
D.	Provision for tunnel rehabilitation	1,000.00
E.	Provision for diamond drilling:	
	1. Fleet veins: 1800 lineal ft) @ $12 per l.f. 2. L.L. zone; 700 lineal ft) 3. Provision for exploration - drill camp and supplies	30,000.00 2,500.00
F.	Provision for commissions & contingencies	4,500.00
	TOTAL FIELD EXPLORATION	$45,000.00

Respectfully submitted,

W. M. Sharp

W. M. Sharp, P.Eng.,

WMS:vsm
Encl: Dwg. No. 4.

WMS