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GEOLOGY

BOSE HILL AREA, HIGHLAND VALLEY, B.C.

based on photogeology and previous work

for

CANZAC MINES LIMITED (N.P.L.)

by

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(incomplete – rest not useful.)

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The first season's programme by Canzac was guided by J. Sullivan, who made initial recommendations for an exploration programme on the Lux group on April 2, 1965, and reported on work carried out on October 25, 1965. Mr. A.R. Dodds of Huntec Limited reported on an induced polarisation survey, also in October.

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The writer has benefited from discussion with Mr. M. Zurowski of M.E.M. Consultants, who are directing Canzac's exploration activities.

Physical Features

The Cordilleran region includes three northwesterly trending physiographic sub-provinces: a western system of mountains, an interior system of plateaux and mountains, and an eastern system, mainly of mountains. The Highland Valley is in the interior system, and more specifically, the Interior Plateau. The topographic features of the plateau comprise rolling summits and broad upland areas separated by deeply cut valleys such as the Thompson. The Canzac area reaches 5,700 feet at Bose Hill and drops to 4,000 feet at Forge Creek, a tributary of Guichon Creek.

The region is situated within the dry belt of British Columbia (rainfall at Kamloops is between 10 and 11 inches a year). The lower slopes of the hills support an open, park-like forest with little

Reference to north as the edge of the mosaic should be checked in the field.

Fracturing is the principal control of drainage in the area. Largely from the drainage patterns two orders of fractures can be seen, major faults or fault zones, relatively widely spaced, and minor faults or joints in relatively uniform and closely spaced sets.

The main branches of Forge Creek follow the major faults: faults of direct interest will be described individually:

1. From centre of Lux 19, strikes 033 to Lux 39 and 028 to Trojan prospect. Largely through gravel area south of Bose Hill. Strong break followed by series of small creeks.

2. From turn in 1 at centre of Lux 19, strikes 337 onto Krain property Fault valley largely filled by gravel. Moderately defined.

3. 1,500 feet E. of Lux 38, strikes 020. N. end of fault zone parallel with 1. N.N.W. joints terminate against it to N. and S.

4. Crosses end of 3, 1,500 feet E. of Lux 38, strikes 000. Well developed member of poor joint system, probably utilised by later fault movement.

5. From the E border of the mosaic area strikes 301 towards Lux 40. Better defined linear expression than most members of its set (6,7,8).

6. From E border of the mosaic area strikes 297 towards Lux 44. Poorly defined fault zone, may be of importance as E extension of 7. Part of set 5,6,7,8.

7. From Lux 14 across Lux 30,45,444. W.end is flanked on N by esker. Broad, strong linear member of fracture zone. Part of set 5,6,7,8.

8. 500 foot wide fault zone, strikes 298 from Lux 50 and 52 towards E border of area. Part of set 5,6,7,8.

9. From N. boundary of Lux 40 strikes 077 into group E of Lux. Marked by relatively short broad gully which may be purely a downslope consequent stream. If so, it would be unusual for such a strong feature in this area, therefore it is regarded as fault controlled.

10. 500 foot broad fault zone. Trending 145 between faults 6 and 8, E of Lux group. Parallel fractures to the north may also be faults. This zone is regarded as more important because of its breadth.

11. From Lux 32 across Lux 49 to Lux 52, strike 051. Sharply defined linear valley followed by a main branch of Forge Creek.

12. From Lux 52 strikes 049 into new claims. Narrow break, possible extension of 11 across end of 8.

13. From just N. of Lux 53 strikes 051. Compares with 11 and also followed by Forge Creek.

14. From E end of 13, strikes 117 towards E border of area. Poorly defined narrow fault zone.

15. From Lux 16 strikes 320 across Lux 15 and Lux 17. S. end flanked on S.W. by esker, N. end followed by Forge Creek. Long broad fault zone, probably formed in parts by trellis of minor faults.

Jointing is considered as the sets of relatively short fractures which have the same overall aspect on aerial photographs as members of lesser orders do in outcrop.

In the high treed ground to the west, few joints are recognized in marked contrast with the eastern park land. The sets which control much of the minor topography, because they were followed by glaciation, trend about 150 north of No. 6 and 7 fault zone and 165 south of No. 8 fault zone. Between the two faults the evidenceis unclear as to change or duplication of direction of fractures and glacial movement directions.

In the northeast of the area a set perpendicular to the first, striking 063, is also common. Member joints are short, 1,000 feet or less. Southeast of the Lux group are two N.N.E. sets, one striking 025, the other 012. They compare with and on analysis may be found to complement the 165 set. Two fractures east of the south part of the Lux Group, which strike 054 may be minor faults.

A few minor fractures parallel the faults, e.g., west of 1 and N. and S. of 9, and may be subsidiary faults.

Relatively few fractures do not fit into the sets described.

The initial jointing in the granite could take place on cooling. Mapping, preferably by Cleos techniques, might be expected to ascertain the nature of the jointing, but for the present one may consider that the variations in principal joint directions in the Guichon batholith are cooling phenomena rather than subsequently imposed features. In contrast, the longer fractures which commonly cross the joint sets are considered to be post intrusive faults. (Item 7 of White et al, in their brief history).

Joints which are large enough to be apparent on aerial photographs must be considered as master joints. Faults may be of various types.

Faults 1,3,11,12 and 13 appear to be relatively simple, clean breaks.

Faults 5,6,7,8,10 and 14 are fault zones. In some places true faulting may be seen, elsewhere an increased density of jointing.

Fault 4 is simple but has probably utilized an existing cooling joint.

Fault 15 is composite, formed in part by a trellis of minor faults.

ECONOMIC GEOLOGY

White et al describe three principal types of deposit:

1. Veins, which occur in faults and joints.
2. Disseminated, commonly associated with closely spaced fracturing.
3. Collapse breccia deposits - by far the most important.

Any weak structure which is deepseated enough to provide a channelway for mineralisation is significant. Joints are commonly local paths for mineralisers, but unlikely to be major channelways. Of the types of faults interpreted from aerial photographs, the simple breaks and parallel subsidiaries may well provide locii for vein deposits, and the fault zones for disseminated deposits. Any initial line of weakness for collapsing breccias might well also be faulting, perhaps preferably a fault zone, or intersection of zones.

White et al described the Trojan deposit, adjacent to the south of Lux, as follows: "From a brief examination it is apparent that the Trojan deposit is similar in many respects to the breccia deposits of the Bethlehem Copper property. The country rock resembles Guichon quartz diorite but the geology has not been mapped in detail. The deposit is in a complex of the distinctive Trojan breccia, large horses of massive quartz diorite and numerous tabular bodies of dacite porphyry. This complex appears to be elongated in a direction slightly east of north and to dip either vertically or steeply eastward. It is cut by several faults that strike a little more easterly than the complex as a whole and dip steeply eastward".

No. 1 fault strikes east of north from the east side of the Trojan zone and its relationship should be verified in the field. The N.N.W. fault also on the east side of the Trojan is parallel to No. 2 fault zone which adjoins No. 1 on Lux 19.

The Krain zone was described by White et al as follows: "A large area of disseminated copper mineralization apparently exists on this property but little can be learned of its nature from the thoroughly oxidised material in the development trenches -- The material in the trenches is closely jointed and faulted quartz diorite cut by northeasterly striking dykes of dacite porphyry". Carr's more recent work shows N.N.W. dykes to prevail over N.E. ones, presumably following the cooling? joints evident on the aerial photographs. The road to the property appears on the photo-mosaic to follow a major N.W. fault, which would be large enough to act as a channelway for copper mineralisation.

The induced polarisation survey already carried out on the southern part of the Lux group has three anomalies outlined by Sullivan (Oct. 20, 1965). Anomaly B, the largest, is where faults 1 and 9 come together. Anomaly C is on fault 1. Future drill set-ups should allow for these faults.

CONCLUSIONS AND RECOMMENDATIONS

Canzac now has about 200 claims of which roughly eight have been covered by an I.P. survey. It is recommended that before drill targets are definitely decided on, preliminary studies should be completed for the properties as a whole. The most convenient and economic way in which this can be done is by geochemistry, stream sediment sampling throughout the property, followed by soil sampling where stream sediments indicate high values: in the present case only copper need be tested for, and the rule of thumb is 10% of the area covered by stream sediment sampling may be expected to require follow-up work.

The cost of such a survey would be about $4,000.00.

Priorities may be considered from the structural evidence.

Lux Group	A.	Lux 19, intersection of Faults 1 and 2.
	B.	Lux 14, intersection of Faults 7, 11, and 15.
	C.	Lux 50 and 52, intersection of Faults 8, 11 and 12.
Forge Group	D.	Forge 4, S.E. corner.
New Claims	E.	Intersection of Fault zones 8 and 10.
	F.	Intersection of Faults 3 and 4.
	G.	Intersection of Faults 13 and 14.

Visual inspection of these zones, particularly those in the less forested new claims, may indicate that soil sampling is warranted while waiting for the stream sediment samples from the balance of the property. Orientation samples should first be taken over the Krain and Trojan zones.

In areas where sampling the B soil horizon indicates anomalous copper values, consideration must be then given whether to outline the mineralization by sampling the C horizon (adjacent to bedrock) where migration of metal is at a minimum, or by induced polarisation surveys. In general it is better to outline the deposit before stripping, trenching and drilling. These examination phases might be best conducted under the control of a resident geologist who should utilize the greater part of his time in geological mapping; a graduate student well versed in structural techniques may be most suitable.

Respectfully submitted

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