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COMINCO LTD.

EXPLORATION N.T.S. 82 M/5 WESTERN DISTRICT
January 6, 1977

ASSESSMENT REPORT

1976 GEOLOGICAL, GEOCHEMICAL AND TRENCHING REPORT

ON

BET 1, BET 2, BET 3, BET 4 and BET 5 MINERAL CLAIMS

KAMLOOPS MINING DIVISION, BRITISH COLUMBIA

LATITUDE: 51°20'N - LONGITUDE: 119°55'W

Period of Work
August 13-September 16, 1976

P.J. Wojdak, M.Sc.

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SUMMARY

Cominco's Bet claims (45 units) straddle Birk Creek 3 km west of North Barriere Lake, 85 km northeast of Kamloops, B.C. Work in 1976 consisted of geological mapping, a soil geochemical survey and rehabilitation of old bulldozer trenches. The property is underlain by metamorphosed, gently dipping Paleozoic volcanic and sedimentary strata. Major lithologies are argillaceous metasediments and basic and felsic metavolcanic rocks. Three mineralized areas were examined. Mineralization consists of zones of essentially barren massive pyrite and zones of disseminated pyrite-sphalerite-galena-chalcopyrite. Copper, lead and zinc in soils are low over most of the area surveyed. Anomalous values occur near known showings and are also scattered along and to the north of Birk Creek.

INTRODUCTION

This report describes results of preliminary exploration by Cominco Ltd. on the Bet claims, 85 km northeast of Kamloops, B.C. The program consisted of geological mapping, a soil geochemical survey and clearing out old trenches by bulldozer. Geological mapping was conducted by P.J. Wojdak between August 13 and September 6, 1976. D.M. Carr acted as field assistant from August 13-31, 1976. D.M. Carr and Erwin Gammel conducted the soil geochemical survey from September 1-16. The exploration program was supervised by F.D. Gill. Bulldozer work, contracted to Lewis Bloomfield of Barriere, was carried out between August 23-25, 1976. Data are presented on a 1:5,000 topographic map prepared by Pacific Survey Corporation and McElhanney Surveying and Engineering.

LOCATION AND ACCESS

The Bet claims straddle the deeply incised valley of Birk Creek 3 km west of North Barriere Lake at $51^{\circ}20^{\circ}N$, $119^{\circ}55^{\circ}W$ (Figure 1) on N.T.S. sheet 82 M/5. Access is by gravel road from Barriere, 25 km to the west, a small town on Yellowhead Highway 60 km north of Kamloops. The property is within the Kamloops Mining Division.

PROPERTY AND OWNERSHIP

The Bet property consists of 5 claims within the Kamloops Mining Division as follows:

Claim	Legal Corner Post	<u>Units</u>	Date Recorded
Bet l	03230	15	June 14, 1976
Bet 2	03231	16	June 14, 1976
Bet 3	03457	4	August 30, 1976
Bet 4	03458	2	August 30, 1976
Bet 5	31617	8	September 23, 1976

HISTORY

Most, if not all showings on the property were discovered by prospectors before 1930 and explored by hand tunnelling. Showing names used in this report are those which can be best identified from descriptions in Ministry of Mines Reports of 1924-1928. Subsequent exploration has been carried out by Kennco Explorations (1951-52), Mining Corporation of Canada Ltd. (1966) and Ducanex Resources(1971), prior to Cominco's acquisition of the ground.

REGIONAL GEOLOGY

The Bet property is underlain by Paleozoic Eagle Bay Formation, a belt about 100 km long by 35 km wide. It consists of volcanic rocks, graphitic argillaceous sediments and limestone. These have been converted to phyllites and schists during relatively low grade (greenschist) metamorphism but relatively intense structural deformation featuring two phases of folding. Eagle Bay rocks are intruded by the Cretaceous-age Baldy granitic batholith. In the contact metamorphic aureole biotite and cordierite are developed in pelitic rocks. The northern boundary of the Bet property is within one kilometre of this intrusive and at the periphery of discernable contact metamorphic effects.

BET PROPERTY GEOLOGY

Outcrop on the claims is sparse, about 5%. Best exposures are small cliffs along Birk Creek, but bedrock is also exposed on some tributary creeks and along logging roads. Property geology is shown in Figure 2, a 1:5,000 topographic map.

Stratigraphically the lowest rocks are meta-andesite and meta-basalts (map unit la) which are poorly exposed near the northern boundary of the property. Similar rocks are exposed better east of the Bet claims. They range from massive, dark green chlorite schists to, more commonly, banded feldspar-chlorite schists in which alternating chloritic and feldspathic laminations vary from 0.2 to 2 cm. thick. The banding is interpreted to be metamorphic segregation induced in originally homogeneous fine grained andesite and basalt. Accessory minerals include 1-5% disseminated pyrite and carbonate. Chlorite schists grade into weakly foliated hornblende "spotted" schists (map unit lb). In the latter, randomly oriented amphibole forms at the expense of preferentially oriented chlorite thereby giving the rock an apparent intrusive texture and diorite mineralogy. This is probably due to contact metamorphism of the nearby Baldy batholith.

Map unit 2a consists of felsic volcanic rocks now metamorphosed to soft, pale green or buff sericite schists that underlie the north slope of Birk Creek. Relict feldspar phenocrysts can account for up to 20% of the rock, but are commonly replaced by carbonate and weather to a distinctive tan colour. The matrix is a fine grained mixture of sericite, quartz, feldspar, minor chlorite and variable disseminated pyrite. The sericite schists are derived mainly from dacitic volcanic rocks although more chlorite-rich varieties (map unit 2b) are probably derived from andesite. The unit is about 400 m thick in the west but thins eastward. Unit 2 contains 1-20m thick interbeds of black carbonaceous slate and phyllite. Three such interbeds are shown on Figure 2, one on a dip slopenorth of the Rainbow showing.

The 15m thick mineral horizon (map unit 3) consists of chert and cherty sericite schist with rare limestone beds. Mineralization consists of thin seams and disseminations of pyrite, locally with lesser sphalerite, galena and chalcopyrite. Lenses of massive pyrite occur locally.

Felsic quartz-eye bearing acid volcanic rocks (map unit 4) underlie the south side of lower Birk Creek. They are grey to buff in colour, somewhat similar to meta-dacites of unit 2 except for the presence of 5-10% disseminated quartz-eyes (to 0.5 cm in size). Near the CC showing and elsewhere along Birk Creek these are strongly sheared pyritic quartz-eye sericite schists but up slope (stratigraphically higher) they are less sheared and contain relict feldspar phenocrysts in addition to quartz. Feldspar phenocrysts are partly replaced by calcite, the matrix consists of quartz, felspar and sericite. The unit is about 300m thick at its maximum.

The acid volcanic rocks are overlain by argillaceous sedimentary rocks of map unit 5. These include black (graphitic) slate and argillite, thin bedded siltstone-argillite sequences and massively bedded greywacke. Thin bedded siltstone-argillite sequences are typical of distal turbidite sedimentation but there are occasional 1 metre-thick greywacke interbeds. These are graded and indicate tops to the southwest. Greywackes contain quartz clasts that could have been derived from underlying quartz-eye volcanic rocks.

Several outcrops of massive pale green quartz-feldspar porphyry dacite (map unit 6) occur within the sedimentary sequence. These rocks are only weakly foliated and fragmental textures (1-10cm fragments) are evident. They are similar to the less sheared rocks of unit 4.

STRUCTURE

Bedding and foliation are parallel; average strike is about 120° with a 20° southwesterly dip. Locally, markedly different attitudes suggest folding but, although small scale open rolls can be observed in sedimentary strata, no large scale folds have been recognized on the property. Evidence of another phase of deformation is provided locally by a steeply dipping, northerly trending cleavage in addition to a bedding plane cleavage.

MINERALIZATION

Location of the CC, Rainbow and Lynx showings is shown in Figure 2. Trenches at the CC showing bulldozed in 1966 had caved in and some of these were rehabilitated. Figure 3 shows a chain and compass survey of the trenched area. The bulldozer used was a 1956 D-6, model 9U. Trench dimensions are tabulated below:

	Trench 1	Trench 2	Trench 3
Length	35m	25m	20m
Width	8m	5m	5 m
Initial depth of trench (caved)	1.5m	lm	2m
Final depth (rehabilitated)	2.9m	2.5m	4.4m
Volume moved	392 cu.m.	187.5 cu.m.	240 cu.m.

Rocks in the trenched area are chert and siliceous quartz-eye sericite schist of map unit 3 with pyrite as disseminations and very thin (mm thick) seams. These host a thin band of pyrite-sphalerite-galena-chalcopryite mineralization. Assay widths (location shown on Figure 3) are:

Stratigraphic Width	<u>Cu</u> %	Pb%	Zn%	oz Ag/Ton
0.2 m	0.28	2.0	4.2	0.83
0.2 m	0.18	1.1	1.5	0.21
O.3 m	0.34	1.7	3.1	0.49

Attempts to expose bedrock in two nearby trenches met with little success and were quickly flooded.

At the Rainbow showing mineralization is exposed in small cliffs and in 5 old adits (each 5-15m long). Lithologies present are limestone, thin-bedded black argillite of map unit 5, pyritic chert and siliceous sericite schist of map unit 3. Mineralization consists of (a) lenses of massive pyrite that is essentially barren, but contains minor chalcopyrite and (b) very sparsely disseminated pyrite, galena, sphalerite and chalcopyrite. Massive pyrite lenses range from 1-2 cm to 2-3m in thickness. Three grab samples assayed:

Cu%	Pb%	Zn%	<u>Ag</u>
3.08	0.40	0.22	0.39
0.34	0.05	0.05	0.08
0.21	0.05	0.05	0.07

The disseminated pyrite-sphalerite-galena-chalcopyrite mineralization is contained within a 10-15m thick bedded chert and cherty sericite schist unit which contains occasional 15cm thick massive pyrite beds. A grab sample assayed 0.30% Cu, 0.60% Pb, 0.57% Zn and 0.18 oz Ag per ton. The Lynx showing is 350m north of the Rainbow showing on a tributary creek known locally as Lynx Gulch. Rocks are black argillite and very minor amounts of sericite schist. A 2m thick massive pyrite lens is exposed in the gully. No assay sampling was done.

GEOCHEMISTRY

The area covered by the soil survey straddles Birk Creek. Amex Exploration Services were contracted to cut the baseline and cross lines 0+00N, 5+00N, 5+00S, 10+00S, 15+00S and 20+00S. Control on other lines was by chain and compass. B horizon soils were sampled at 30m intervals on lines spaced 100m apart and the -80 mesh fraction analyzed for Cu, Pb and Zn at Cominco's Vancouver laboratory (Figures 4, 5, 6) using a hot 20% nitric acid leach and atomic absorption analysis. Separation of background and anomalous populations was done using Sinclair's logarithmic cumulative frequency plot. For zinc, less than 130 ppm is background, 130-300 ppm represents an overlap of background and anomalous populations and values over 300 ppm are definitely anomalous. Copper and lead plots suggest three data populations as indicated below:

	Background	Intermediate	Anomalous
Cu	25 ppm	25-200 ppm	200 ppm
Pb	50 ppm	26-130 ppm	130 ppm

These values (300 ppm Zn, 200 ppm Cu, 120 ppm Pb) may be compared with threshold values arrived at by visual inspection of histograms (Zn - 450 ppm, Cu - 100 ppm, Pb - 100 ppm). Areas of known mineralization near the Lynx and Rainbow showings are anomalous, but the CC showing did not give a good response. Geochemical response south of Birk Creek is generally flat but there are scattered anomalous values along and on the north side of Birk Creek. The highest copper anomaly (950 ppm) is near the Rainbow showing and most other high values are 200-300m north of the CC showing. A broad area north of the CC showing is also anomalous in zinc although it is not exactly coincident with the copper anomaly. Zinc anomalies also occur downslope from mineralization at Lynx. The largest zinc value (5000 ppm) is an isolated high on the south side of Birk Creek midway between CC and Rainbow showings and away from known areas of mineralization. Samples anomalous in lead group near the Rainbow showing.

CONCLUSIONS

Mineralization on the Bet property is stratigraphically controlled. Minor showings of massive pyrite and disseminated pyrite-sphalerite-galena-chalcopyrite are hosted by siliceous rocks within a sequence of felsic meta-volcanic rocks. A geochemical survey failed to delineate soil anomalies of significant area.

Report by: M.Jojdak, M.Sc.
Geologist

Endorsed by:

D.W. Heddle, P. Eng. Assistant Manager Western District

Approved for

Release:

W.T. Irvine, P. Eng.

Manager

Western District

PJW/aa January 6, 1976

REFERENCES

- Sinclair, A.J., 1974, Selection of threshold values in geochemical data using probability graphs, Journal of Geochem. Expl., Vol. 3, pp 129-149.
- 2. British Columbia Ministry of Mines Annual Report 1924, p. 153; MMAR 1927, p. 190; MMAR 1928, p. 211.

ATTACHMENTS

- 1. Appendix "A" : Exhibit "A" Statement of Expenditures
- 2. Appendix "B" : Statutory Declaration in Support of Expenditures
- 3. Appendix "C" : Statement
- 4. Figure 1 : Bet Location 1":10 miles
- 5. Figure 2 : Geology 1:5,000
- 6. Figure 3 : CC Showing, Rehabilitation of 1966 Trenches, 1:500:
- 7. Figure 4 : Geochemical Plan Cu, 1:5,000
- 8. Figure 5 : Geochemical Plan Pb, 1:5,000
- 9. Figure 6 : Geochemical Plan Zn, 1:5,000

APPENDIX A

EXHIBIT "A"

STATEMENT OF EXPENDITURES ON BET 1-5 CLAIMS FOR 1976

Salaries:

P.J. Wojdak - August 13-15, August 20-Sept. 6, 21 days @ \$90/day. Report writing and drafting, 8 days @ \$80/day	\$ 1,890.00			
D.M. Carr - August 13-20, August 23-Sept. 16, 33 days @ \$50/day	1,650.00			
Erwin Gammel - Aug. 31-Sept. 16, 17 days @ \$45/day	765.00			
Preparation of topographic map (by Pacific Survey Corp. and McElhanny Surveying and Engineering)	by 775 . 00			
Grid Preparation (linecutting) 4.7 miles @ \$250/miles (as per attached copy of cost statment)	1,175.00			
Bulldozer trenching contracted to Lewis Bloomfield, Barriere, B.C.	812.00			
Assays by Bondar Clegg Laboratories, 12 samples at \$13.50 for Cu, Pb, Zn, Ag	162.00			
Geochemistry, at Cominco's Vancouver Laboratory:				
764 soil samples @ \$2.35 for cu, Pb, Zn 7 rock samples @ \$3.50 for Cu, Pb, Zn	1,795.00 24.50			
Field equipment and supplies	418.00			
Truck rental	1,016.00			
Food and accomodation at North Barriere Lake and at Barriere	1,307.00			
TOTAL EXPENDITURES	\$12,429.50			

Signed: /

This is "Exhibit A" to the Statutory Declaration of Expenditures relating to the geological, geochemical and trenching program on the Bet 1, Bet 2, Bet 3, Bet 4 and Bet 5 mineral claims declared before me on the day of January, 1977 A.D.

A Notary Public in and for the Province of British Columbia

APPENDIX "B"

IN THE MATTER OF THE

B.C. MINERAL ACT

AND

IN THE MATTER OF A GEOLOGICAL, GEOCHEMICAL AND

TRENCHING PROGRAM CARRIED OUT ON THE

BET 1, BET 2, BET 3, BET 4 AND BET 5 MINERAL CLAIMS

Located in the Kamloops Mining Division of the Province of British Columbia

More Particularly N.T.S. 82M/5

AFFIDAVIT

- I, PAUL J. WOJDAK OF THE MUNICIPALITY OF DELTA IN THE PROVINCE OF BRITISH COLUMBIA, MAKE OATH AND SAY:
- 1. THAT I AM EMPLOYED AS A GEOLOGIST BY COMINCO LTD., AND AS SUCH HAVE A PERSONAL KNOWLEDGE OF THE FACTS TO WHICH I HEREINAFTER DEPOSE;
- 2. THAT ANNEXED HERETO AND MARKED AS "EXHIBIT A" TO THIS MY AFFIDAVIT IS A TRUE COPY OF EXPENDITURES ON A GEOLOGICAL, GEOCHEMICAL AND TRENCHING PROGRAM CARRIED OUT ON THE BET 1, BET 2, BET 3, BET 4 and BET 5 MINERAL CLAIMS.
- 3. THAT THE SAID EXPENDITURES WERE INCURRED BETWEEN THE THIRTEENTH DAY OF AUGUST AND THE SIXTEENTH DAY OF SEPTEMBER, 1976 FOR THE PURPOSE OF MINERAL EXPLORATION ON THE ABOVE NOTED CLAIMS.

Sworn Before Me at the City of Vancouver in the Province of British Columbia this _____ day of January, 1977.

A NOTARY PUBLIC IN AND FOR THE PROVINCE OF BRITISH COLUMBIA

A.J. WOJDAK

APPENDIX "C"

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

STATEMENT OF QUALIFICATIONS

- I, PAUL J. WOJDAK, OF THE MUNICIPALITY OF DELTA, BRITISH COLUMBIA, HEREBY CERTIFY:
- THAT I AM A GEOLOGIST RESIDING AT 11405-85 AVENUE, DELTA, BRITISH COLUMBIA WITH A BUSINESS ADDRESS AT 2200-200 GRANVILLE SQUARE, VANCOUVER, BRITISH COLUMBIA.
- 2. THAT I GRADUATED WITH A B.Sc. IN GEOLOGY AND CHEMISTRY FROM McMASTER UNIVERSITY, HAMILTON, ONTARIO in 1971 AND WITH A M.Sc. IN GEOLOGY FROM THE UNIVERSITY OF BRITISH COLUMBIA IN 1974.
- 3. THAT I HAVE PRACTISED GEOLOGY WITH COMINCO LTD. FROM 1974 TO 1977.

DATED this _____ Day of January 1977 at Vancouver, British Columbia.

Signed: P.J. Wojdak, M.Sc.











