

GEOLOGICAL REPORT

on the

WIGWAM PROPERTY

Revelstoke Mining Division

British Columbia

Submitted by



October 16, 1968
Vancouver, B.C.

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WIGWAM PROPERTY

SUMMARY AND CONCLUSIONS

The mineral claims covering the Wigwam property have not been assessed under current economic and technological advances. Metal prices have increased considerably since the late 1920's and a reassessment of ore reserves and grades is warranted.

General geological mapping and prospecting have not been recently accomplished. Structure plays an important role in the localization of mineralization. Little development work has been carried out between the 2500 and 3125 foot elevations.

The widespread sulphide mineralization in such a favourable host rock provides excellent possibilities for finding extensive replacement deposits within flat-lying beds and folds of large areal extent. With property preparations an exploration programme could be carried out over this property on a year-round basis.

Easier access to the workings could be provided by constructing a road from the west side of the property. Such a road would alleviate the costly problem of moving heavy equipment to the workings and would also make water more readily available.

RECOMMENDATIONS

It is recommended that an initial programme of systematic sampling of all surface exposures and underground workings be carried out in conjunction with detailed mapping of the mineralized areas. If results warrant, a further programme of diamond drilling, both underground and surface, should be undertaken.

GEOLOGICAL REPORT

WIGWAM PROPERTY

Revelstoke Mining Division, B.C.

INTRODUCTION

An examination of the Wigwam Property was made by the writer on October 7th and 8th, 1967, at the request of Messrs M. M. Pardek and N. M. McCartney of Vancouver, B.C. The purpose of the examination was to investigate the various old workings and showings, and assess the potential of the property.

PROPERTY

The property consists of 76 mineral claims held by location, as follows:

<u>Claim</u>	<u>Expiry Date</u>
Big M #1-6 inclusive	November 13, 1967
Big M #7-8	December 18, 1967
Buck #1-10 inclusive	January 19
Big T #1-12 "	May 30
Mel #1-2 Frac	December 18
Big M #9-12 inclusive	December 18
Big R #1-14 "	October 27
Big Valley #1-4 inclusive	
Big Ike #1-2	
Big Eddy #1-2	

PROPERTY (Continued)

<u>Claim</u>	<u>Expiry Date</u>
Hianna #1-16 inclusive	
Big N #1-12 "	

The claims cover the entire old Wigwam Mining Company property. The claims are presently owned by Messrs M. M. Fardek and N. M. McCartney of Vancouver, British Columbia.

LOCATION

The Wigwam property lies on the western flank of the Selkirk Mountain Range, Revelstoke Mining Division, B.C. It is at 119° W Longitude and $50^{\circ} 50'$ North Latitude, approximately 20 miles south-easterly from the town of Revelstoke on the Trans-Canada Highway.

The partially paved Arrowhead Highway leads southward from Revelstoke. At Mile 17 an all-weather gravelled logging road turns east and follows the Akolkolex River. The road passes through the Wigwam property at Mile 9.8 and is maintained by the Akolkolex River Logging Company.

Although the topography is steep, the mountains do not attain altitudes much greater than 6,000 feet. The hillsides are covered with good stands of cedar, pine, balsam, birch and poplar.

Winters are relatively mild but of long duration with heavy snows. Temperatures range from $60-80^{\circ}$ during summer months and rainfall is moderate.

The Akolkolex River and its tributaries have sufficient flowage for all phases of mining, milling and domestic use. Little water

LOCATION (Continued)

is available in the immediate area of the old workings.

Diesel power would be necessary for the initial stages of development.

Shipping of concentrates from the Revelstoke-Arrowhead branch of the Canadian Pacific Railway is readily feasible. The railway is approximately 10 miles west of the property.

Most supplies may be obtained from Revelstoke. Good daily express services will enable purchasing locally unobtainable goods from major centres in either British Columbia or Alberta.

HISTORY

In 1924 the property was acquired by the Wigwam Mining Company of Tacoma, Washington. Over a six-year period, work included diamond drilling, trenching, open-cutting, and thirteen tunnels along 4500 feet of outcrop. The Schlumberger Electrical Prospecting Company executed a survey of the area in 1920. Thirty-nine holes were drilled along the outcrop for a total footage of 5,877 feet. Some drill data, but few assay results were available to the writer, except for a report that 73 feet of sulphides were intersected in the silicious marble in the vicinity of the workings on the 3250 level. Diamond drill hole No. 20 was the only one for which assays were available. Over 52 feet the weighted average was 9.87% Pb and 15.20% Zn.

During the mid-1950's, the Consolidated Mining & Smelting Company, Ltd., Trail, B.C. completed an intensive programme of

HISTORY (Continued)

detailed mapping and channel sampling of all workings. The mapping brought to light an intricate system of complex folding similar to the Duncan Mine and others of the Kootenay Arc metallogenic province. Secondary and possible tertiary folding appears to control the localization of replacement mineralization. Pertinent data was not made available to the writer.

References to the Wigwam property are made in the Minister of Mines Annual Reports for 1915, 1921, 1923 to 1931, 1960 and 1961.

GENERAL GEOLOGY

The overall structure of the Selkirk Mountain Range is essentially geosynclinal with a northwesterly trend. To the east lies the metamorphosed Lardeau Series of the Windermere System of Upper Proterozoic Age. The Series is comprised of schists, phyllites, quartzite, slate and limestone.

Conformably underlying the Lardeau Series is the Badshot Formation of Upper Precambrian Age. The Badshot is a grey, siliceous, crystalline marble and limestone which forms the western limb of the synclinal structure and is overturned to the northeast. The Hamill Series of quartzite, schist and limestone is west of, and conformably underlying, the Badshot Formation. The gneissic granite of the Nelson Batholith forming the Monashee Range lies west of the Columbia River. The batholith, of Precambrian Age, follows the Illecillewaet River Valley to the north. Post-Triassic granites of the Kuskanax Batholith lie to the south. A major N-S fault in the area lies along the

GENERAL GEOLOGY (Continued)

Columbia River Valley between Revelstoke and Arrowhead. Three short splays occur to the west.

GEOLOGY - DETAILED

The main rock type exposed on the property is the Badshot Formation. It is a white to gray crystalline fetid marble which is locally silicified and well banded in places. Sericite is quite common in the marble with very sparse purplish fluorite and little apatite. Tremolite was noted in one location.

The Badshot strikes N 30° W and has an average dip of 25° N.E., forming the western limb of a large syncline. Minor rolls and folds within the marble are very common. Small anticlinal structures and areas of flat-lying beds form the most prominent loci for emplacement of sulphide bodies. These bodies are siliceous and ramify irregularly in all directions. The replacement by pyrrhotite, pyrite, sphalerite and galena occurs along bedding planes as narrow bands or wide irregular lenses. Pyrrhotite and pyrite are the most abundant sulphides with sphalerite predominating over subordinate amounts of galena.

The mineralization appears to have its derivation from the nearly intrusive igneous rocks of the Kuskanax Batholith. Secondary and tertiary folding control the localization of replacement bodies. Paragenesis of the sulphides appears to be pyrite, pyrrhotite-sphalerite, and galena. Only one period of mineralization is evident.

The Badshot has responded to deformation by flowage, brecciation and shearing more or less parallel to formational boundaries. The physi-

GEOLOGY - DETAILED (Continued)

cal properties of the carbonaceous rock controlled the deformation, and the deformation pattern probably controlled the migration and precipitation of the sulphide minerals.

Evidence of faulting was noted in one place along the marble unit. It is expressed topographically. NE-SW jointing is rather poorly developed. The Badshot marble could possibly be 300 to 500 feet thick. Underlying the marble is a series of biotite schists, argillaceous quartzites and limestones, as witnessed in the area of the lowest workings.

MINERAL DEPOSITS

In the following description of the various mineral occurrences, elevations were obtained with an altimeter using a base elevation of 1500 feet at Revelstoke. Tabulation of the numerous workings and showings is used for clarification.

<u>Showing</u>	<u>Elevation</u>	<u>Description</u>
(1)	2175'	The lowest working is a drift about 75 feet above the Akolkolex River on the north side of the logging road. A tunnel is collared in biotite schist and argillaceous limestone. The adit is caved and the work could not be examined. Judging from material seen on the waste dump, the tunnel did not encounter the Badshot marble.
(2)	2225'	300 feet west of the above tunnel is a 50-ft.

MINERAL DEPOSITS (Continued)

- tunnel collared in a 20-foot boulder and the remainder is in partially consolidated gravel.
- (3) 2500' 900 feet along the trail is a short 15-foot tunnel collared in white marble. It was driven along a 1-foot wide band of oxidized sulphides. Scattered sulphides were noted in the marble.
- (4) 2600' 1100 feet S 80° W further along the outcrop is a tunnel with 386 feet of crosscut, 227 feet of drift and a 50-foot raise. Near the portal the tunnel cross-cuts white marble which grades into a highly silicified zone near the collar of the drift, 151 feet from the portal. A 5.5' chip sample was taken across banded replacement sulphides from the right wall at the junction of the crosscut and drift. Assay results were: Trace Au; 0.15 oz Ag; 0.44% Pb and 6.05% Zn. Another 5' channel sample on the same zone ran 0.24% Pb and 4.67% Zn. The crosscut continues for another 135 feet, passing through crystalline limestone containing a conformable 50-foot bed of biotite, augen schist about 50 feet from the face. 102 feet along the northwesterly drift, a 4' x 8' inclined raise was driven in the right wall for 50 feet across the beds. The raise is at approximately 45°. The drift was driven

MINERAL DEPOSITS (Continued)

along a highly altered gossaned, lenticular band which varies from 1 to 6 feet in thickness. A 5.5' chip sample of this material at 145 feet from the collar assayed: Trace Au; 0.15 oz Ag; 2.14% Pb; 8.20% Zn. At 150 feet from the drift collar a 7.5' channel sample ran 1.45% Pb and 12.60% Zn. 27 feet from the face, a 6.5' chip sample ran: Trace Au; 0.30 oz. Ag; 1.40% Pb and 11.05% Zn. Banded sulfides occur at the drift face. A narrow band of oxidized sulphides occurs 115 feet from the crosscut portal. Just above the portal is a trench revealing oxidized sulphides.

(5) 2625' About 100' N.W. of the above adit is a 50-foot tunnel. Near the portal a 3-foot band of massive sulphides was noted. There is a sloughed-in trench 25' west of the portal.

(6) 3075' Trenching has exposed highly folded beds which are massively replaced by pyrrhotite, sphalerite and galena. A 9-foot channel sample assayed 1.45% Pb and 7.11% Zn. The actual thickness of the zone could not be determined. The trench is about 150 feet below the trail. The zone dips 30° E.N.E. and strikes N.N.W.

(7) 3100' Further along the trail, there is a trench exposing a light and dark banded, silicified

MINERAL DEPOSITS (Continued)

- limestone with sparse sulphides. A 9-foot channel sample ran 0.34% Pb and 0.89% Zn.
- (8) 3250' 300 feet beyond the above trench, a grab sample taken from banded sulphides exposed in an outcrop along the trail gave 0.25 oz Ag; 6.45% Pb, and a trace of zinc.
- (9) 3275' 225 feet further along the hillside, the silicified marble is flat-lying and mineralized with sphalerite and sparse galena along bedding planes. The zone appears to be mineralized over a thickness of more than 50 feet and is traceable updip for a length of 1400 feet. A series of grab samples ran 0.10 oz. Ag; 0.80% Pb, and 4.10% Zn.
- (10) 3425'
(Galena Adit) 200 feet north of the above showing, a 50-foot crosscut was driven along a 1-2 ft. wide zone of coarse galena and sphalerite, galena predominating, in silicified marble. A grab sample of some of this material assayed 1.60 oz. Ag; 21.00% Pb, and 2.30% Zn. Sparse amber-coloured sphalerite and galena occur in the marble along the outcrop for some 200 feet.
- (11) 3275'
(Crooked Adit) 200 feet from the 3275' elevation showing, at S 50° W, there is a short 35-ft. drift. The tunnel was driven into a small anticline in silicified marble. A 10-ft. crosscut was driven

MINERAL DEPOSITS (Continued)

- in the left wall and a 15-ft. vertical raise at the face. Bands of replacement sulphides were noted in most of the tunnel. "S"-shaped folding was evident. To the right of the portal a 14-foot channel sample assayed 3.42% Pb and 2.71% Zn. A 4.8 foot channel sample by Cominco ran 4.96% Pb and 2.36% Zn.
- (12) 3250' Two trenches were cut 100 feet east of the above adit. One assayed 1.3% Pb and 12.20% Zn across 7 feet. The sample was taken by the Wigwam Mining Company. The trenches are partially sloughed in.
- (13) 3350' 150 feet north of the above drift, a trench exposes banded replacement sulphides.
- (14) 3350' 100 feet southwest, a 75-ft. long trench reveals (Trench No. 3) a wide zone of mineralized siliceous marble. More intense mineralization occurs in the upper 6 feet of the trench with weaker occurrences in the lower beds. Mineralized beds approximately 50 feet thick were exposed. Cominco sampled the bottom 10 feet of the exposure which assayed 0.8% Pb and 1.7% Zn. The richer portion was not sampled.
- (15) 3375' 50 feet west of the above trench is another showing a 10-ft. zone of banded sphalerite and galena

MINERAL DEPOSITS (Continued)

- of apparently good grade. The Wigwam Mining Company sampled 8 feet which ran 2.6% Pb and 7.2% Zn.
- (16) (Trench No. 7) The trench cuts bands of oxidized sulphide. A 5-foot zone was channel sampled by Cominco. It assayed 1.0% Pb and 3.8% Zn.
- (17) 3475'
(Trench No. 5) 175 feet further west is an open cut which exposes a massive sulphide zone. In the upper portion of the cut is a highly folded zone of pyrrhotite. Below the massive pyrrhotite-sphalerite zone, banded pyrrhotite, pyrite, sphalerite and galena occur in siliceous marble. The cut has bared the mineralized beds for a true thickness of 25 feet. A grab sample composed of specimens from the upper and lower extremities ran 0.15 oz. Ag; 1.55% Pb, and 4.25% Zn. Cominco channel sampled 5 feet which graded 0.8% Pb and 4.1% Zn.
- (18) 3475'
(No. 13 Adit) 125 feet further west, a tunnel has been driven for 110 feet in silicified marble and has a 15-foot vertical raise at the face on the right side. The siliceous marble forms a slight anticline. On the east side of the portal an open cut has exposed banded sulphides over a length of 75 feet. Grab samples taken here gave Trace of Ag; 2.75% Pb; 6.95% Zn and 0.40 oz. Ag;

MINERAL DEPOSITS (Continued)

- 13.35% Pb and 5.20% Zn. Mineralization is rather weak in the tunnel. Cominco channel sampled an 8-foot section which ran 1.50% Pb and 5.20% Zn.
- (19) 3525'
 (Trench No. 4) 50 feet above the 3475 level portal a 15-ft. zone of banded sphalerite and subordinate galena is exposed. Cominco assayed a 9-foot section running 0.8% Pb and 4.80% Zn.
- (20) 3575'
 (Trench No. 8) Bands of pyrrhotite, sphalerite and galena are exposed in the trench. Cominco channel sampled an 8-foot sample which assayed 1.6% Pb and 4.00% Zn.
- (21) 3550'
 (Trench No. 3) The trench is located 100 feet west of Trench No. 4 and cuts hi-grade zones of oxidized sulphides. Crystalline limestone occurs at the top of the trench. A channel sample taken by Cominco across 14 feet assayed 0.9% Pb and 3.0% Zn.
- (22) 3600'
 (Trench No. 2) The trench is 100 feet west of Trench No. 3 and has two mineralized zones separated by 10 feet of limestone. The upper zone has not been sampled but Cominco channel sampled 9 feet which ran 3.6% Pb and 5.4% Zn.
- (23) 3700' 200 feet north of Trench No. 2 is an adit which was driven for 40 feet. Immediately above the portal is a 15-foot wide highly folded zone of

MINERAL DEPOSITS (Continued)

(24)

3625'
(No. 11 Adit)

massive pyrrhotite, sphalerite and galena. The zone strikes N.N.W. and dips 55° N.E.

The tunnel is located 100 feet west of Trench No. 2. Over 600 feet of crosscuts, drifts and raises were driven developing 3 separate mineralized zones. At the portal the silicified beds strike N 30° W and dip 20° N.E. Above the portal the beds are oxidized over a width of 20 feet. Kennecot channel sampled an 18-foot section near the portal which assayed 1.7% Pb and 4.1% Zn. Zone A, to the west, has not had its true thickness exposed in the drift. A total of 15 channel samples were taken over a length of 80 feet. They averaged 5.39% Pb and 7.11% Zn across an average width of 3.9 feet. A total of 13 channel samples were taken in Zone B, the central zone, over a strike length of 330 feet. They averaged 2.97% Pb and 4.97% Zn over an average width of 6.8 feet. The Zone was crosscut across a true width of 20 feet. The eastern zone, Zone C, developed by 2 raises ran 8.25% Pb and 7.50% Zn across 11 feet. These assays appear in doubt as another set of samples taken in the southernmost raise gave 0.42% Pb and 1.30% Zn across 12.2 feet.

MINERAL DEPOSITS (Continued)

- (25) 3610' 50 feet of No. 11 Adit is another adit which is caved at the portal. The tunnel apparently crosscuts the B Zone just below the portal of the No. 11 Adit.
- (26) 3850'
(Trench No. 1) The trench is 100 feet long and exposes 3 well-mineralized zones. Cominco channel sampled a 5-foot section which assayed 0.30% Pb and 3.30% Zn.
- (27) 3900' 100 feet along the trail from Trench No. 1 a 20-foot zone of highly oxidized sulphides is partially exposed.
- (28) 3925' Directly above the 3900' level showing is a zone channel sampled by Kennecot over a length of 60 feet. A total of 8 samples averaged 8.25% Pb and 6.65% across 3.5 feet.
- (29) 4075' 50 feet above the trail trenching has revealed a zone of pyrrhotite, sphalerite and galena.
- (30) 4150' Along the trail highly oxidized material was noted under light overburden.
- (31) 4200' A trench which has partially sloughed in exposes massive sulphides. An 8-foot sample cut by the Wigwam Mining Co. ran 6.20% Pb and 11.6% Zn.
- (32) 4230'
(Gold Adit) The drift was driven for approximately 225 feet between two mineralized zones. The lower zone is highly folded and mineralized with pyrrhotite,

MINERAL DEPOSITS (Continued)

sphalerite and galena.

- (33) 4300' Immediately above the Gold Adit a trench reveals massive sulphides. A 4-foot sample cut by the Wigwam Mining Co. assayed 0.7% Pb and 10.60% Zn.
- (34) 4380'
(Sleepers Adit) 550' further along the trail from the Gold Adit lies the Sleepers Adit. The tunnel was driven for 25 feet in sparsely mineralized rock. A channel sample over 7 feet to the right of the portal ran 0.68% Pb and 0.46% Zn.
- (35) 4440' Immediately above the Sleepers Adit is a zone which was sampled in two places 150 feet apart by Cominco. The eastern sample ran 4.80% Pb and 3.30% Zn across 2.5 feet. The western sample assayed 7.00% Pb and 5.60% Zn across 3 feet.
- Mineralization was encountered several hundred feet west of the Sleepers Adit.

ESTIMATE OF COST

PHASE I

Accommodation	\$ 100.00/week
Transportation	70.00
Meals	70.00
Assaying	640.00
Engineering/Supervision	700.00
Telephone	20.00
Contingencies	<u>200.00</u>
	\$ 1,800.00/week

It should take approximately one week to execute the above programme.

Contingent on the completion of Phase I, and economic studies of the results, the following work should be undertaken:

Phase II

Road Construction	\$ 10,000.00
Diamond Drilling	40,000.00
Camp	4,000.00
Assaying	2,000.00
Core Shed, Equipment	500.00
Engineering/Supervision	10,000.00
Head Office/Administration	8,000.00
Legal Fees	2,000.00
Utility Vehicle	4,000.00
Contingencies	<u>9,000.00</u>
	\$ 89,500.00

Upon completion of the Phase II programme, a compilation and study of all data should be made to determine the feasibility of putting the property into production.

Respectfully submitted,

Thomas R. Tough, B.Sc.
Geologist

October 16, 1968
Vancouver, B.C.